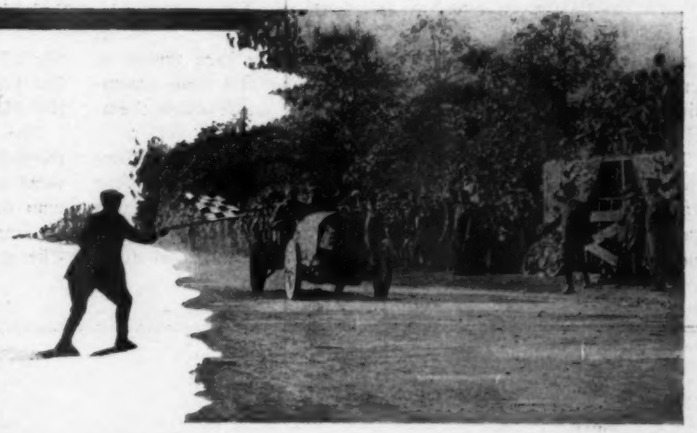
VOL. XXV. NEW YORK—THURSDAY, OCTOBER 12, 1911—CHICAGO No. 15

THE AUTOMOBILE

Bergdoll in Benz, Fairmount Winner

Erwin Bergdoll, Driver of the Big Benz Car Which Won the Fairmount Park Race and Established New Lap and Race Records



The Winning Bergdoll-Benz Combination Being Given the Checkered Flag by Starter Gantert

PHILADELPHIA, PA., Oct. 9.—Leading practically all the way, Benz No. 8, driven by the boyish millionaire, Erwin Bergdoll, won the sweepstakes and the class 6C prize over the Faimount Park course today. The Benz broke the record for the classic; raised the level of average speed to 61.25 miles an hour; lowered the lap mark to 7:28 and cleaned up all around.

Mercedes, No. 17, driven by Spencer Wishart, the same car that raced into a forward position in the 500-mile sweepstakes at Indianapolis on Decoration Day, finished second in the general race and first in its class, flashing past the finish line 1:41 ahead of Lozier No. 3, Ralph Mulford's mount. The Mercedes was protested immediately after the finish for failing to carry its crew throughout and the protest was allowed.

National 16, Disbrow, won the Class 4C division from the consistent-running Stutz, piloted by Anderson.

In Class 3C, the only car to complete the full course was Mercer No. 11, Hughes, which made the distance in 209:45.30. When the race was called off, the Ohio pair were still jogging around, No. 12 having completed twenty laps and No. 19 having finished twenty-two rounds of the 8 1-10 mile course.

The course was not in the best condition, having dried

The Winners

DIVISION 6C.

No. 8. Benz.
Bergdoll driver.
Time, 3:18:41.25.

DIVISION 5C.

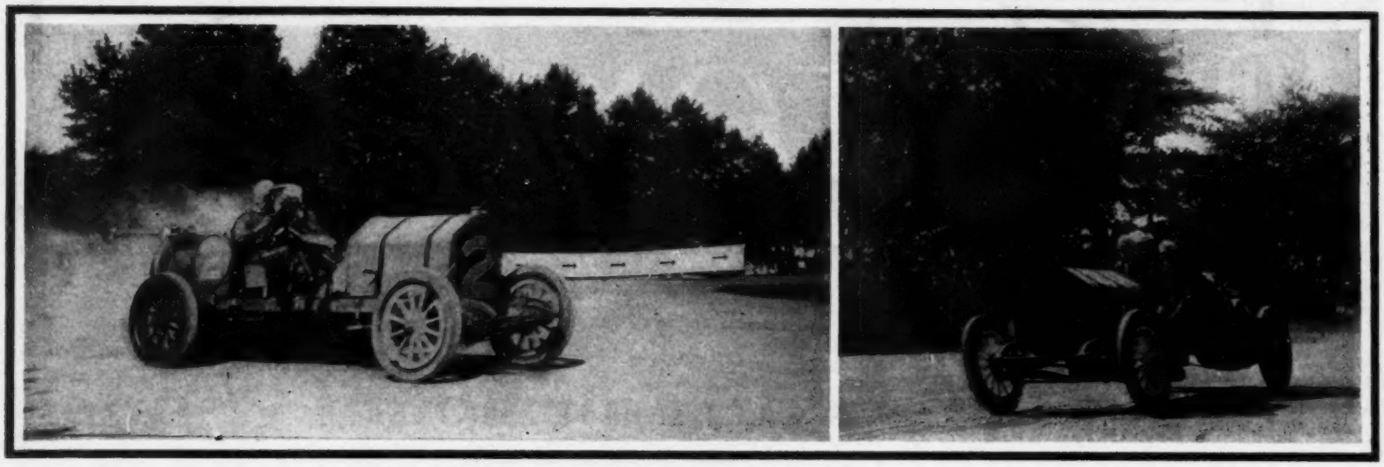
No. 17. Mercedes.
Wishart driver.
Time, 3:20:11.42.

DIVISION 4C.

No. 16. National.
Disbrow driver.
Time, 3:23:22.32.

DIVISION 3C.

No. 11. Mercer.
Hughes driver.
Time, 3:29:45.30.



National No. 2, driven by Zengel, who won last year's race in a Chadwick

Disbrow National, No. 16, winner in its class

out on top to such an extent that the racing cars threw up dense dust clouds in making the turns. The fast time accomplished was due to the improvement in the automobiles themselves rather than to course conditions.

The crowd was rather slow in assembling, but just before noon the seat-holders in the grandstands poured in and when Starter G. Hilton Gantert lined up the contestants, there was scarcely a vacant seat. All around the course the crowds assembled to witness the speed struggle and while the total number of those who witnessed the race was much below that of last year, it is estimated that at least 350,000 saw the triumph of the Philadelphia-owned car.

The cars were arranged in two lines, the even numbers on the pole and the odds on the rail and the heads of the columns were sent away at 20-second intervals. F. E. Edwards, chairman of the Technical Committee of the Contest Board, stood at Starter Gantert's elbow throughout this important function. The start was very perfect.

FOURTH ANNUAL 200-MILE FAIRMOUNT PARK

Division 6-C—For Cars Whose Piston Displacement

No.	CAR	Piston Displacement	DRIVER	1	2	3	4	5	6	7	8	9	10
8	BENZ	730	Erwin Bergdoll	7.34	15.02 7.28	22.41 7.39	30.28 7.39	38.19 7.51	46.02 7.43	53.30 7.28	61.06 7.36	68.48 7.42	76.47 7.59
15	FIAT	615	J. Fred Betz, 3d	7.52	15.41 7.49	Out— broken connecting rod							

Division 5-C—For Cars Whose Piston Displacement

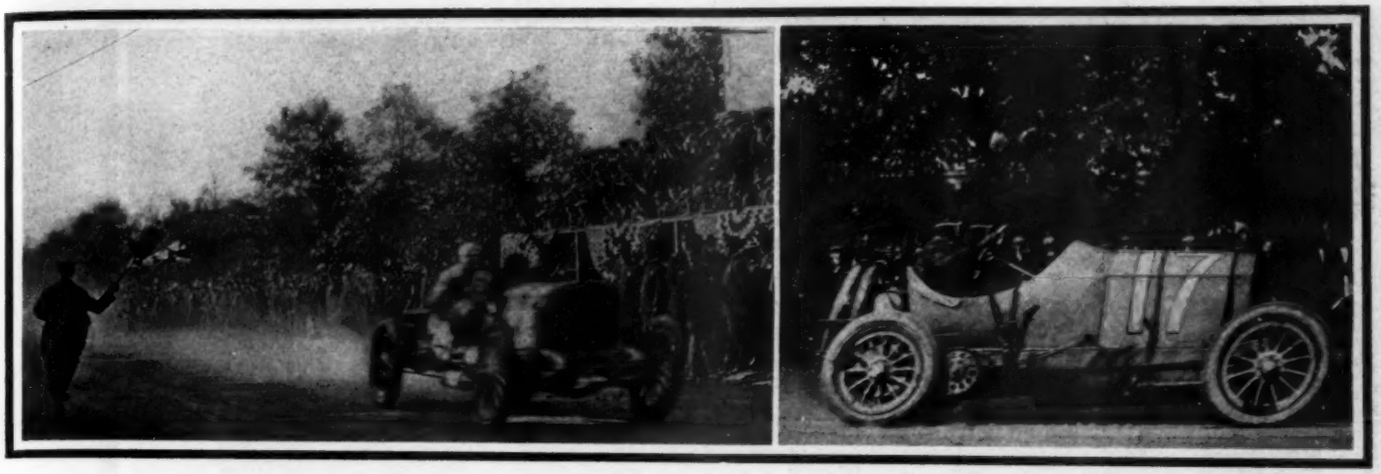
No.	CAR	Piston Displacement	DRIVER	1	2	3	4	5	6	7	8	9	10
2	NATIONAL	589	Len Zengel	7.51	15.40 7.49	27.43 12.03	35.38 7.55	43.34 7.56	51.27 7.53	59.15 7.48	67.03 7.48	74.55 7.52	82.59 8.04
3	LOZIER	544	Ralph Mulford	7.55	15.47 7.52	23.40 7.53	31.34 7.54	39.30 7.56	47.32 8.02	55.23 7.51	63.13 7.50	70.57 7.44	78.48 7.51
9	LOZIER	544	Harry Grant	8.17	16.25 8.08	24.34 8.09	32.41 8.07	40.51 8.10	48.58 8.07	57.02 8.04	65.04 8.02	73.08 8.04	81.13 8.05
17	MERCEDES	583	S. Wishart	7.52	15.40 7.48	23.30 7.50	31.26 7.56	39.19 7.53	47.12 7.53	55.06 7.54	63.02 7.56	70.57 7.55	79.37 8.40
18	MERCEDES	560	W. Wallace	8.27	16.41 8.14	24.59 8.18	33.19 8.20	41.31 8.12	49.44 8.13	57.57 8.13	66.07 8.10	74.20 8.13	84.04 9.44

Division 4-C—For Cars Whose Piston Displacement

No.	CAR	Piston Displacement	DRIVER	1	2	3	4	5	6	7	8	9	10
6	NATIONAL	447	Donald Herr	8.38	17.09 8.31	25.33 8.24	34.04 8.31	43.25 8.31	51.03 8.28	59.16 8.13	67.30 8.14	75.42 8.12	84.00 8.18
10	STUTZ	389.9	Gil. Anderson	9.09	17.55 8.46	26.36 8.41	35.24 8.48	44.18 8.54	53.22 9.04	62.18 8.56	71.07 8.49	80.21 9.14	89.20 8.59
16	NATIONAL	447	Louis Disbrow	8.30	16.46 8.16	24.58 8.12	33.12 8.14	41.24 8.12	49.32 8.08	57.38 8.06	65.42 8.04	73.57 8.15	82.07 8.10

Division 3-C—For Cars Whose Piston Displacement

No.	CAR	Piston Displacement	DRIVER	1	2	3	4	5	6	7	8	9	10
4	COLE	286	Chas. Basle	9.24	18.58 9.34	28.22 9.24	37.42 9.20	47.39 9.57	57.45 10.06	Out—carbureter trouble			
5	MERCER	300.6	Ralph De Palma	8.20	16.49 8.29	25.05 8.16	33.22 8.17	41.38 8.16	49.55 8.17	58.11 8.16	66.24 8.13	74.31 8.07	82.37 8.06
7	CASE	300.7	J. Jagersberger	8.41	17.22 8.41	26.03 8.41	34.47 8.44	43.21 8.34	51.52 8.31	60.24 8.32	68.51 8.27	79.02 10.11	87.26 8.24
11	MERCER	300.6	Hughie Hughes	8.21	16.27 8.06	24.51 8.24	33.06 8.15	41.15 8.09	49.23 8.08	57.36 8.13	65.51 8.15	74.05 8.14	82.24 8.19
12	OHIO	299	George Parker	9.29	18.46 9.17	27.47 9.01	36.49 9.02	45.44 8.55	54.35 8.51	76.43 22.08	85.36 8.53	94.34 8.58	103.34 9.00
19	OHIO	299	H. S. Matthews	9.58	19.54 9.56	29.49 9.55	39.39 9.50	49.23 9.44	59.04 9.41	68.47 9.43	79.00 10.13	88.57 9.57	98.44 9.47



Mulford's Lozier, finishing second in its class

Wishart's Mercedes, which was disqualified for losing its mechanician

National No. 2, Zengel, was first away, followed by Lozier No. 3, Mulford; then came the Cole No. 4, Basle, and Mercer No. 5, De Palma, and so on to the end of the line, which was occupied by Ohio No. 19, Matthews.

National No. 2 was the first to appear at the head of the stretch on the initial round and came down to the wire wide open in 7:51, widening the distance between it and the pursuing Lozier by 4 seconds on this circuit.

But neither of these cars was destined to enjoy a leading position for the round, or in fact at any time during the race, as the giant Benz No. 8 came down to the line in 7:34, lowering the lap record for the course by 4 seconds, even though the standing start would seem to have interposed an insurmountable obstacle to record breaking. That first swift round foreshadowed the ultimate result of the race, for it was a foregone conclusion after the time was posted that, barring accidents, there was nothing that could catch the flying leader.

During the preliminary practice the speed of this car was

ROAD RACE--TIME BY LAPS—OCTOBER 9, 1911

Ranges From 601 to 750 Cubic Inches

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
84.33	92.31	100.08	109.13	116.43	124.25	134.48	142.20	149.53	157.06	165.06	172.37	182.07	191.03	198.41.35
7.46	7.58	7.37	9.05	7.30	7.42	10.23	7.42	7.33	7.35	7.48	7.31	9.30	8.56	7.38

Ranges From 451 to 600 Cubic Inches

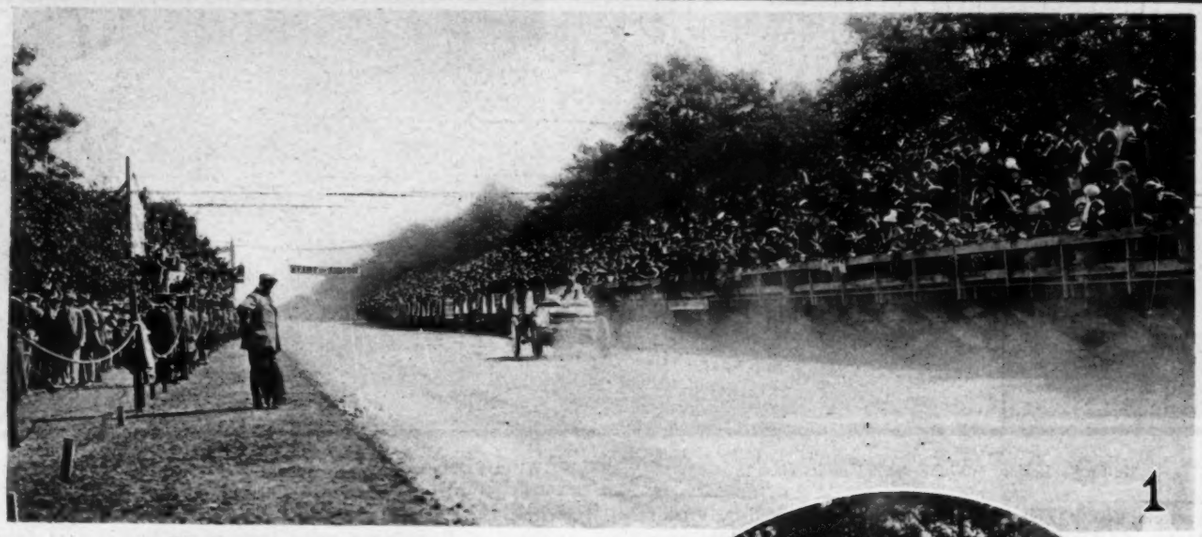
90.55	98.44	106.33	114.18	122.02	129.47	137.35	147.46	155.46	167.01	174.53	182.47	190.30	198.14	205.59.36
7.56	7.49	7.49	7.45	7.44	7.45	7.48	10.11	8.00	11.15	7.52	7.54	7.43	7.44	7.45
86.36	94.19	102.00	109.50	118.34	126.26	135.19	143.03	150.47	158.31	166.15	175.50	186.37	194.18	201.52.78
7.48	7.43	7.41	7.50	8.44	7.52	8.53	7.44	7.44	7.44	7.44	9.35	10.47	7.41	7.34
89.43	97.18	105.24	115.32	125.55	133.59	142.05	150.20	158.20	166.28	175.42	183.54	192.08	200.16	208.50.37
8.30	7.35	8.06	10.08	10.23	8.04	8.06	8.15	8.20	8.08	9.14	8.12	8.14	8 08	8.34
87.29	95.14	103.02	110.50	118.40	126.28	134.18	142.01	149.51	157.41	165.46	177.00	184.47	192.30	200.11.42
7.52	7.45	7.48	7.48	7.50	7.48	7.50	7.43	7.50	7.50	8.05	11.14	7.47	7.43	7.41
92.29	108.32	117.49	127.01	145.01	154.08	169.05	179.12	188.41	197.19	208.29	217.46			
8.25	16.03	9.17	9.12	18.00	9.07	14.57	10.07	9.29	8.38	11.10	9.17			

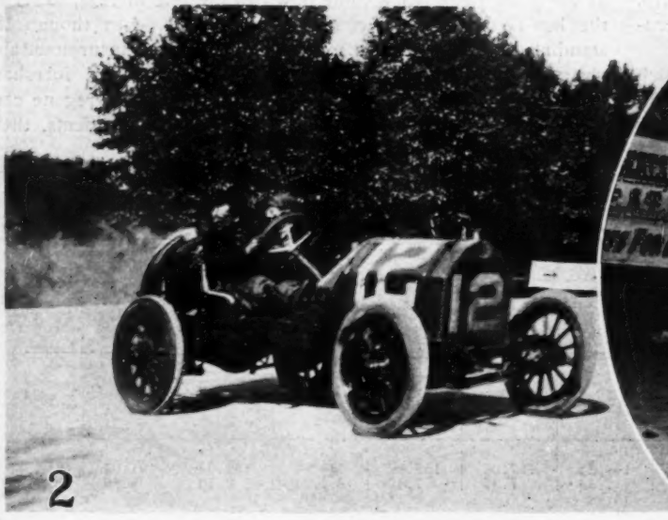
Ranges From 301 to 450 Cubic Inches

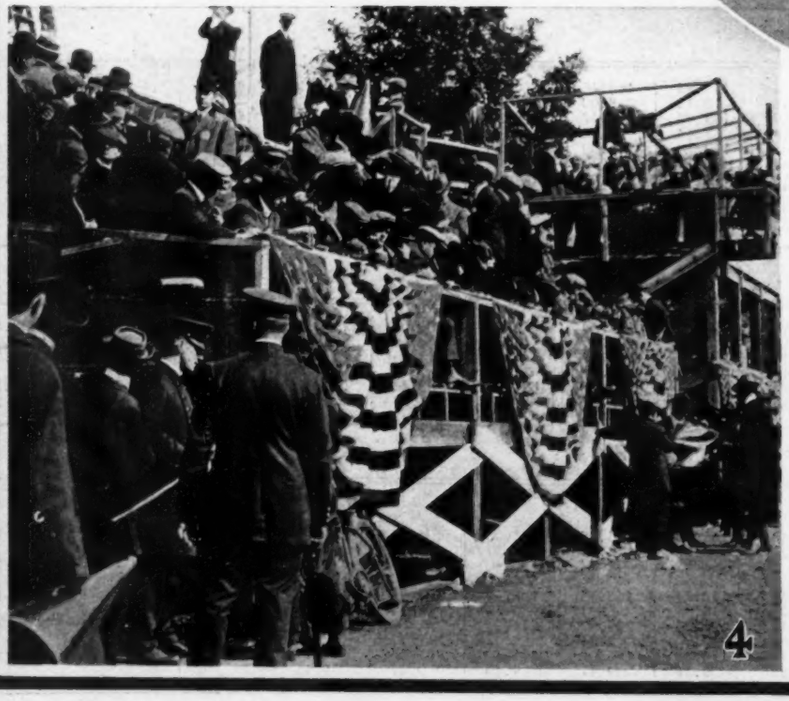
94.49	103.29	111.46	120.01	128.14	136.30	144.48	153.10	161.30	169.47	178.01	186.23	195.12	211.57	220.33.87
10.49	8.40	8.17	8.15	8.13	8.16	8.18	8.22	8.20	8.17	8.14	8.22	8.49	16.45	8.36
98.02	106.40	115.22	124.03	132.48	141.42	150.30	159.14	168.09	176.00	185.36	194.21	203.03	211.45	220 23.05
8.42	8.38	8.42	8.41	8.45	8.54	8.48	8.44	8.55	7.51	9.36	8.45	8.42	8.42	8.38
90.15	98.16	106.24	114.30	122.35	131.12	141.00	149.18	158.57	167.09	175.22	183.37	191.52	199.59	208.22.32
8.08	8.01	8.08	8.06	8.05	8.37	9.48	8.18	9.39	8.12	8.13	8.15	8.15	8.07	8.23

Ranges From 231 to 300 Cubic Inches

90.45	98.54	107.17	115.40	125.42	148.16	156.43	165.06	173.28	182.05	191.36	201.38			
8.08	8.09	8.23	8.23	10.02	22.34	8.27	8.23	8.22	8.37	9.31	10.02			
96.04	104.30	113.02	120.40	133.34										
8.38	8.26	8.32	8.38	11.54										
90.39	98.53	107.03	115.10	123.14	131.29	139.50	150.24	158.35	166.49	175.24	183.56	192.35	201.14	209 45.30
8.15	8.14	8.10	8.07	8.04	8.15	8.21	10.34	8.11	8.14	8.35	8.32	8.39	8.39	8.31
114.57	123.57	133.02	142.15	151.27	160.43	187.17	196.23	205.27	214.34					
11.23	9.00	9.05	9.13	9.12	9.16	26.34	9.06	9.04	9.07					
108.24	118.13	127.50	137.35	147.22	157.03	166.44	176.22	186.09	195.49	205.36	215.21			
9.40	9.49	9.37	9.45	9.47	9.41	9.41	9.38	9.47	9.40	9.47	9.45			







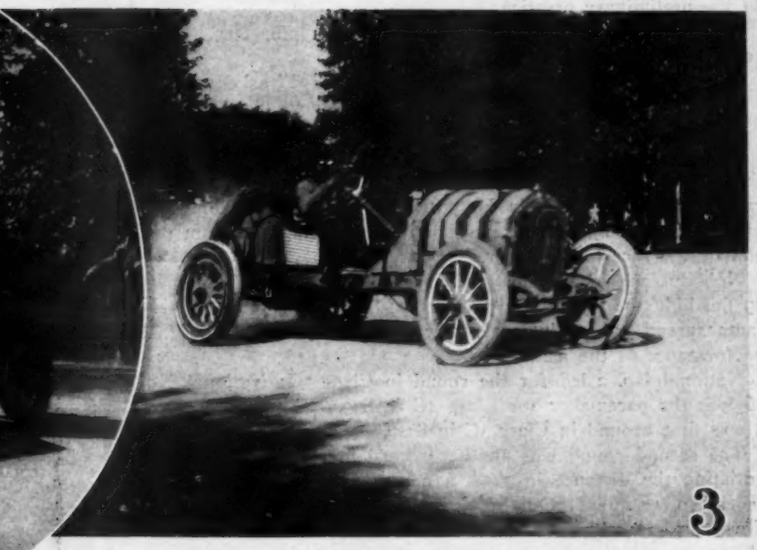
SCENES AT THE FAIRMOUNT PARK RACE

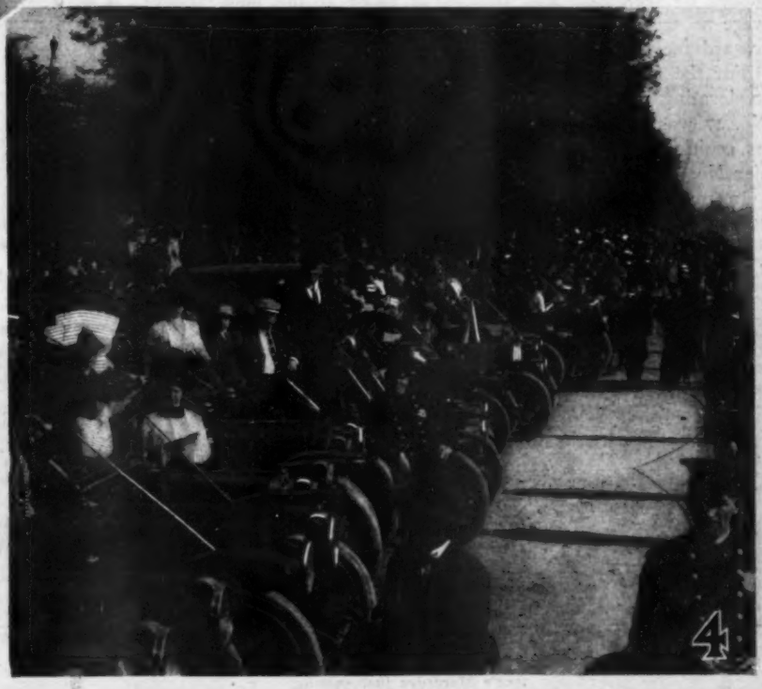
1. Despite the postponement of the race from the previous Saturday, the stands and course were crowded. The illustration shows the excellent manner in which the course was guarded.

2. Ohio car, No. 12, driven by George Parker, which was still running at the conclusion of the race.

3. The Lozier-Mulford combination was a favorite with the crowds—the car is shown passing the grandstand at 70 miles an hour.

4. The accommodations for the 200 pressmen were thorough in every detail, and reflected great credit on the management.





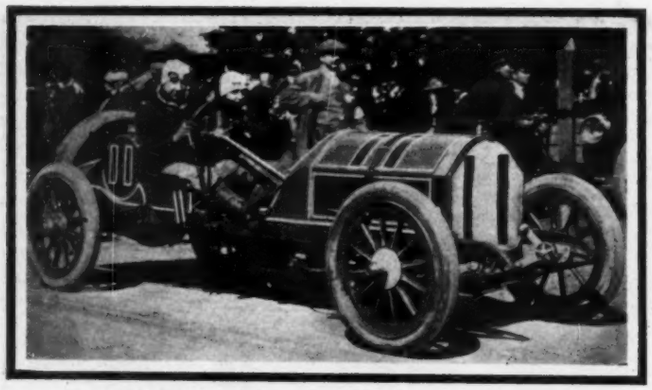
SCENES AT THE FAIRMOUNT PARK RACE

1. In lining up the cars at the start the machines were arranged in two lines, even numbers on the pole, odd numbers on the rail.

2. The winning Benz, with Bergdoll at the wheel, was caught at close quarters by The Automobile staff photographer while the outfit was traveling close to 75 miles an hour.

3. The Stutz entry, No. 10, with Gil Anderson at the wheel, performed creditably throughout the race.

4. The thousands of cars were parked well back from the course, with a strong cordon of police between them and the road.



The Hughes Mercer, which ran consistently and captured 3C honors

specially noted by the contesting drivers and their attitude is best expressed by the sentiment spoken by Mulford before the race in conversing with Zengel:

"Have you passed that big Benz?" inquired Zengel, speaking of the preliminary practice.

"No," replied Mulford, "I haven't passed him, but I have seen him go by."

"Who was that driving the car last Thursday?" asked Zengel.

"Durned if I know," came the answer, "he drove like Hemery."

And that is the whole story.

From the moment Benz No. 8 showed in front at the end of the first lap, with an advantage of 17 seconds over the second car, it was a battle merely for position in the classes. But they made a gallant fight and kept shooting at the big car from one end of the race to the other.

Nobody experienced any trouble in the first round, Ohio No. 19 finishing the lap in last place in 9:58 with the other contestants spread out at intervals between that time and the fast performance of the leader.

National No. 2 led for the round in Class 5C; National No. 16 was the pacemaker for Class 4C in 8:30, while Mercer No. 5 was first around in Class 3C in 8:20.

The second round was another record breaker, the Benz negotiating the distance in 7:28, a new course mark, with Mercedes No. 17 and National No. 2 tied for second honors. National No. 16 still led its class, but in 3C Mercer No. 11 displaced its teammate and showed in front at the tape. There were no mishaps in this round, everybody finishing without untoward incident.

For the following fourteen laps the Benz stayed out in front, moderating its extreme speed in order to save tires. Mercedes No. 17 was second for the next half-dozen rounds, maintaining its position about 2 minutes behind Bergdoll's mount, with Lozier No. 3 in third place, a few seconds back.

In round ten, however, the Lozier went ahead of the Mercedes and began a long stern chase after the leader. For the next six laps the Lozier stayed in second place without cutting down the gap materially.

In the seventeenth round both the Benz and the Lozier stopped for tire changes and the Mercedes, which was only a few seconds behind the white car, moved up into pacemaker's position.

Bergdoll did not essay to wrest the lead away from the Mercedes in one round, but he kept cutting down the seconds for three laps and at the end of the twentieth lap the black car was again setting the pace.

Mercedes experienced trouble in round twenty-two and the Lozer stepped up into second place again, only to succumb to a pair of blown tires in the following lap.

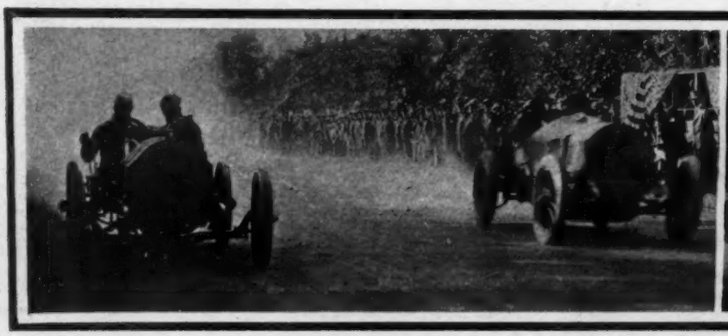
The final round and the finish were not spectacular. Everybody knew that the Benz would win unless it broke an axle and it fulfilled its owner's expectations by making the last lap in 7:38.35, winning rather easily, although by only a moderate margin, in 198:41.35. This is faster than the record-breaking performance of Chadwick last year by more than 10 minutes, which would represent 1¼ laps run in reasonably fast racing time.

The Mercedes finished second in 200:11.42, which is in excess of a mile-a-minute gait, but was disqualified for an unusual occurrence during mid-race. Wishart was going fast down the Sweetbriar incline and when he turned into the straightaway, just before passing Penn mansion, Bob Willoughby, his mechanic, was unseated by the swerve of the car and fell out upon the roadway. Willoughby rolled out of the course of the racing cars and Wishart, not to be delayed for a second at that important stage of the race, went on without him. He picked up another helper at the pits and finished the race as has been told. Willoughby was not seriously hurt.

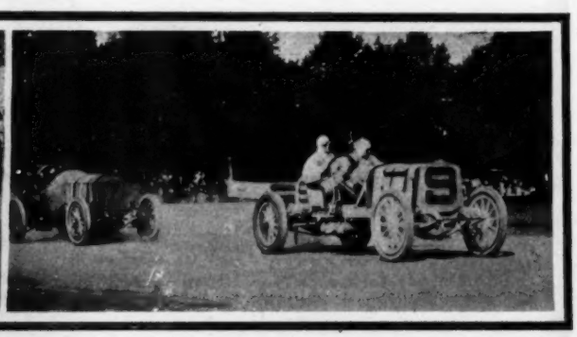
Under the rules a contesting car in such a race as the Fairmount Park must carry a driver and mechanic from start to finish and when formal protest was lodged with Referee Dunlap, on behalf of the Lozier company, the official promptly allowed the protest, disqualified the Mercedes and gave the place to Lozier No. 3.

The matter in all probability will be presented to the Contest Board for revision.

De Palma's Mercer passing the grandstand at a 65-mile clip



De Palma's Mercer drawing up at the pits with a broken steering knuckle—Wallace's Mercedes just passing



Wishart Mercedes overhauling the Grant Lozier at the Belmont Avenue turn

Mercer driven by Hughes, which was the only car in its class to finish the race—the Mercer has just passed the Cole

Looking down the stretch toward the first turn at the top of Sweetbrier Hill

There was virtually no contest in division 6C. Originally three entries were made for this class, including two Fiats of 90-horsepower and the Benz rated at the same power. Fiat No. 1 was scratched after disapproval had been expressed as to the good taste of starting Lee Oldfield as its driver. This left the Bergdoll Benz and the Betz Fiat to fight it out in the big class. The Fiat made two fast rounds, being only 39 seconds behind its rival at the end of the second circuit. But during the third lap a broken connecting rod caused it to limp up to the grandstand and withdraw. Mr. Betz has experienced similar misfortune. Last year his mount broke a crankshaft while well up with the leaders and he was obliged to watch the race from the stand just as he did to-day.

The prettiest struggle of the race was in division 5C, in which there were five starters. These included a special National, rated at 50-horsepower and driven by Len Zengel, who drove last year's winner, a 6-cylinder Chadwick; a pair of Loziers, driven by Mulford, who piloted the second car last year, and Grant, who was at the wheel of the Alco entry which won two Vanderbilt cup races; and a pair of Mercedes cars, rated at 90-horsepower, driven respectively by Spencer Wishart, son of the New York millionaire banker, and Wallace.

The National was only prominent for two rounds when tire troubles intervened and gave it a handicap that could not be overcome. Three different times during the race this car had to stop for tire changes and each stop occurred at a time when it might have had a chance to displace some of the leaders. It was second in the race and first in its class at the end of the first round, but fell back to third place in the next lap. Then came the tire trouble, which was aggravated by its coming about 2 miles from the pits, causing Zengel to drive slowly for that distance and this delay, together with the time spent in making the change, lost something like 5 minutes for the car.

For fourteen rounds the car went along smartly and was within striking distance in round eighteen, when the tires went bad again and the car was laid under still more handicap. Round twenty found it in trouble again, but Zengel finished smartly in 205:59.36, making the last lap in 7:45.

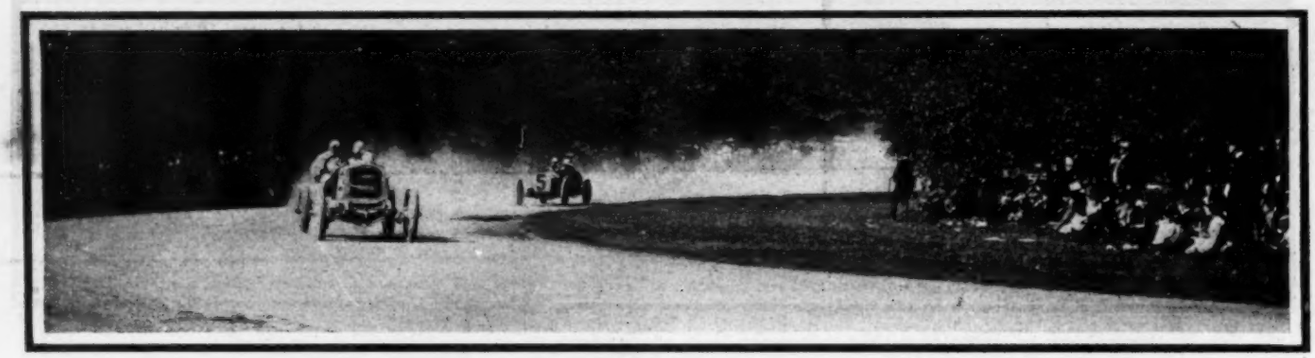
Lozier No. 3, Mulford, ran a brilliant and consistent race. The car started at moderate speed and was not placed until three laps had been made. Mulford maintained an average speed of 7:50 per lap for the first twenty rounds. Two rounds during mid-race were run on weakened tires, but the pilot kept going smartly until the Benz waved the distress signal, when both cars went to the pits. Mulford's crew outdistanced the repairmen of the Philadelphia car in making the change and when the pair returned to the contest, the Lozier actually had gained over 1 minute on its rival. This, however, did not serve to improve its position, as the Mercedes had taken full advantage of the tire trouble to dart into the lead, leaving the Lozier in third place. In round twenty-three the real, heart-breaking mishap occurred from the Lozier viewpoint, as Mulford was again obliged to change tires, dropping back to third place after having wrested second position from the Mercedes in the preceding round. The last laps were negotiated in about 7:40 each, which was not fast enough to get the money.

With regard to the protest filed by Mulford and sustained by Referee Dunlap, the situation developed that if Wishart had stopped to pick up his mechanic, the chances are that the Lozier would have beaten the German car. Of course there is no way to determine just how much strain was removed from tires and mechanism of the Mercedes during the partial round in which it did not carry its full load, but racing experience proves that it amounted to something.

Lozier No. 9, Grant, experienced tire trouble frequently at all stages. In spots this car was estimated to be making 90 miles an hour, which may account for the tire trouble. The car had sparkling speed throughout, but finished over 10 minutes behind the Benz.

Mercedes No. 17, Wishart, had clear sailing all the way. The car made only one slow round, lap twenty-two, when tires were changed, making the time for the round 11:14. It was among the first three from start to finish and in lap eighteen looked to have a strong chance to beat out Bergdoll's Benz. From there to the end, however, it faded out a trifle and after the mishap to its mechanic, was not so sharply driven as in the earlier

After the race hundreds of thousands of spectators flocked over the course



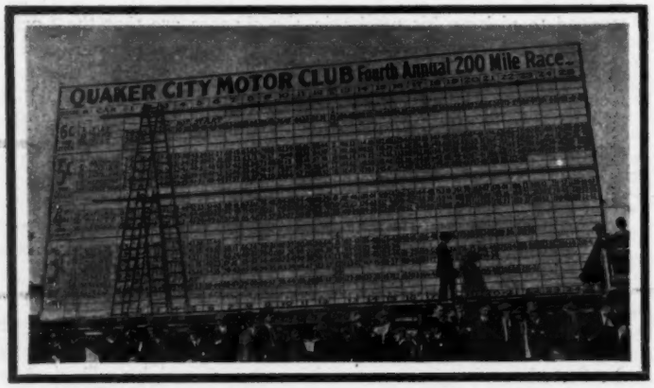
Grant's Lozier leading De Palma's Mercer on the Neill Drive turn—note way crowds were kept back from the course

stages. Its final time was 200:11.42, which is considered faster than the time of previous winners of the classic.

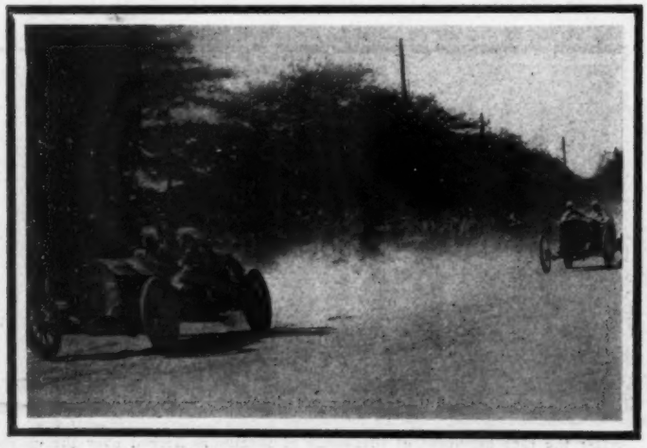
Mercedes No. 18, Wallace, experienced tire troubles and ran through the last ten laps with its engine making signals of distress. No formal reason was given for its poor showing, but it was surmised that either ignition or carbureter was at fault. The car was running at the end but only completed twenty-two laps.

In Division 4C there were three starters, a pair of Nationals and a Stutz. National No. 16, Disbrow, jumped away in the lead and was first at the end of each lap to the finish. The car ran smoothly throughout and gradually increased its lead to the end.

At no time during the race did it make any prominent bid for the general sweepstakes, but it dashed along with a beautiful certainty under the skilled hand of its pilot. Its time was 208:22.32, just under 60 miles an hour on the general average, and ahead of the winner of the general sweepstakes of last year.



The Quaker City Timers' Club had the scoreboard situation well in hand



Grant's Lozier overtaking Mercer No. 5 at the head of the stretch

Stutz No. 10, Anderson, ran an impressive race, never seriously threatening Disbrow's mount, but always shooting at the winner on the long stretches of the course. The Stutz did not have a moment of mechanical trouble and no tire trouble to speak of. It was well handled and its showing attracted a vast amount of attention. It lay in third position in the class until lap 24, when it forged ahead into second place and so it finished. The time of the Stutz was 220:23.05.

National No. 6, Herr, car and driver the same that won the Illinois Cup at Elgin, finished third. Herr followed Disbrow rather closely for twenty-three laps and looked to be surely entitled to second place in the class when a bad tire change caused him to make a slow circuit in round twenty-four and the Stutz displaced him. There was a thrilling duel between National No. 6 and the Stutz in the last rounds, but Anderson had an advantage of 10 seconds in round twenty-four and maintained it to the wire.

Division 3C had seven entries including Cole No. 4, Basle; Mercer No. 5, De Palma; Case No. 7, Jagersberger; Mercer No. 11, Hughes; Ohio No. 12, Parker; Bergdoll No. 14, G. Bergdoll, and Ohio No. 19, Matthews. Bergdoll No. 14 was scratched before the start and the other six formed the field.

Mercer No. 11, Hughes, won all the way and finished all alone in the class. This car was second at the end of round one, being 1 second behind De Palma's Mercer at that stage. But from the second round to the end, Mercer No. 11 stayed out in front. It had no troubles of any kind and simply sailed along at a gait that rivalled the Chadwick's time in 1910. The Chadwick is a Class 6C car, with more than twice the piston displacement of the Mercer. The final time of this car was 209:45.30.

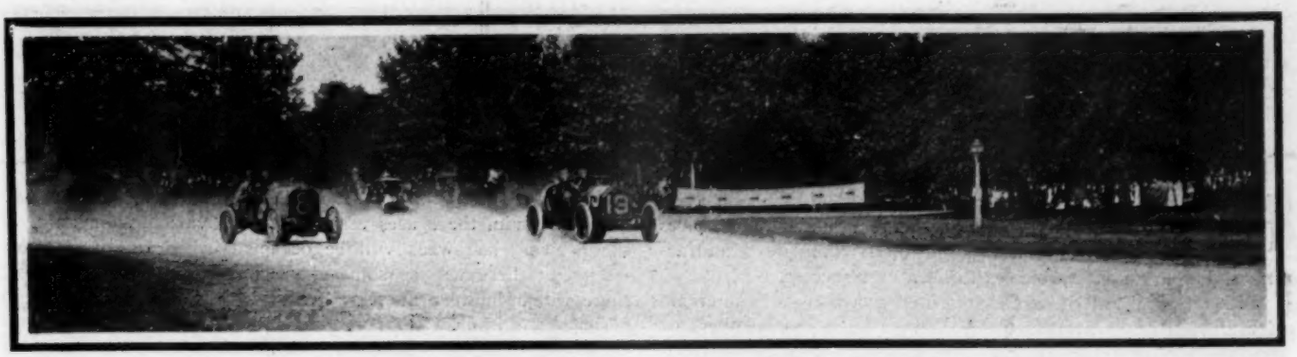
Ohio No. 19, Matthews, was second, finishing twenty-two rounds before the race was stopped. Mercer made a creditable showing from the viewpoints of reliability and speed, but did not show enough of the latter quality to develop anything like a struggle in this class.

Ohio No. 12, Parker, completed twenty laps before the checkered flag announced the finish. It had three very slow rounds, the result of tire trouble far from the pits or stations, but was running well at the finish.

Cole No. 4, Basle, finished six laps at moderate speed when carbureter troubles developed and the car retired from the contest.

Mercer No. 5, De Palma, looked like the winner of second place in this class for twenty-two rounds, when a broken steering knuckle caused its retirement. The mishap occurred in front of the stands at the end of round twenty-two and the driver wriggled the disabled car over against the stand after passing the line. For the first fifteen laps this car was only a few seconds behind its teammate, but beginning with that round it fell back until the final mishap put it out of the running.

Case No. 7, Jagersberger, finished thirteen laps at fair speed and was not completely out of the race when it became unmanageable on Sweetbriar hill and, skidding, struck a post. This



The Bergdoll Benz passing Ohio, No. 19, on the turn around the base of George's Hill

resulted in a broken spring and called for the retirement of the car.

Of the sixteen starters in the race, nine finished and three were running when the final flag was dipped.

The race was the fourth annual event staged at Fairmount Park under the auspices of the Quaker City Motor Club. It was originally scheduled to be held on Saturday, October 7, but a wet and slippery course caused the race to be postponed until Monday. Under the conditions, the event was divided into four classes, coming within the limits of Class C.

To each division winner a prize of $1000 will be paid and to the Benz driver goes the sweepstakes prize of $2500. In addition to these purses there were the usual number of accessory prizes of various descriptions, the whole amounting to not far from $10,000.

The subscription for entry was fixed at $500 per car and as there was eighteen cars entered, the proceeds of entry amounted to $9000. The purses given by the club amounted to $6500.

While the crowd was not nearly as great as in other years, the stands were well filled and it was estimated that the receipts would be about $10,000 net, after deducting expenses. Under the conditions by which the City of Philadelphia patrols and polices the course, the net receipts from the sale of seats and privileges goes to organized charity.

The field for this year's race was small in comparison with that of 1910, when thirty-two cars started, and consequently the revenue of the club was much abbreviated. This was the result of several factors, one of the chief being the dispute that arose over the question of who should start the race.

After several heated colloquies with the A. A. A., in which ultimatums were passed to and fro, the original choice of the club, G. Hilton Gantert, was selected to officiate once more.

This decision was reached at a meeting of the full membership of the club, at which a vote was taken to instruct the directors to maintain Mr. Gantert in the position of starter at all hazards, even going so far as to promise financial aid to the extent of $20,000 in order to fight the case in the courts if the necessity arose for such action.

It was charged that the other candidate, Fred J. Wagner, had not supported the race this year or in other years. A letter was received by the club from the Contest Board outlining the necessity of having a man of national reputation handle the flags at the race and pointing out the disadvantages under which an incompetent man would work. This was construed by the club as supporting Wagner's claims and discounting those of Gantert and was considered an ultimatum, as the letter contained a clause cautioning the club to accept the services of the man with the national reputation or suffer the revocation of its sanction.

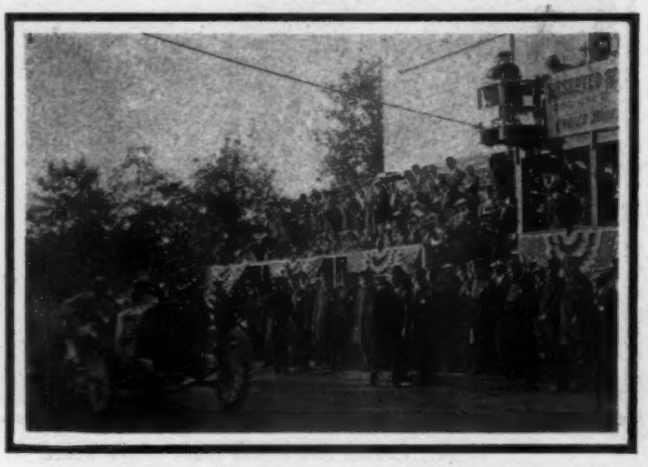
Robert P. Hooper, president of the A. A. A., was present at the meeting and immediately communicated with national headquarters urging some modification of the terms of the ultimatum. About this time Mr. Wagner withdrew from the contest in the interest of harmony and Mr. Gantert got the job.

The race itself was very successful from every point of view. It was truly run, the fastest car winning under deft handling. There was a distinct winner in each of the four classes. In accordance with the good fortune that has ever surrounded this race, there was not a major accident of any kind. The police, 2000 strong, maintained a clear, safe course throughout the running of the race. The day was fine and clear with plenty of warm sunshine and a gentle breeze. The course was not in top-notch condition, being rough in some places and dusty in others. There was very little crowding on the part of the contestants and no mishap resulted from what was experienced.

The only jarring element was the disqualification of the Mercedes car. In this regard it may be said that professional races, such as the annual Fairmount Park events, are run according to binding rules. These rules are framed to give equal justice to all the contestants and the section that specially applies to the case of the Mercedes provides that the driver and mechani-

(*Continued on page 643.*)

The race was well attended despite the postponement



There were bluecoats galore to keep the crowds within bounds

New Palace an Architectural Gem

HOUSED in one of the most beautiful buildings in New York, the automobile show to be given under the auspices of the National Association of Automobile Manufacturers, January 10-17, promises to be a vast success.

With a typical line of cars represented, consisting of the cream of the independent manufacturers as well as of the members of the N. A. A. M. that are not connected with the Automobile Board of Trade, gasoline pleasure cars, electric pleasure vehicles and commercials and gasoline deliveries and trucks will be shown. They are sufficiently numerous and typical of all branches of the industry to form a fitting companion-piece to the Madison Square Garden show.

All but two of the passenger automobiles to be displayed will be shown on the main floor of the new Grand Central Palace.

The second floor will be devoted to the exhibition of trucks and commercials of various kinds, together with the two passenger cars that could not be accommodated on the main floor for reasons of space.

The third floor is to be used for exhibiting accessories.

In the main, the spaces assigned to the various companies at the drawing last week will be occupied by them during show week, but there will be some changes as usual. Besides these, there will be quite a number of additions to the exhibitors and perhaps a withdrawal of two. The changes generally result from the desire on the part of exhibitors to swap spaces and even during the drawing there were several concerns negotiating for an exchange of spaces.

The first drawing resulted in filling the big main floor with pleasure-car exhibitors and considerably more than half filling the second floor with commercials. Mr. Miles announced after the meeting that there would be enough applications filed this week to take up all the available space in the truck section of the Palace show.

There was only one protest filed following the distribution of space and that resulted from the rule that had been adopted, placing the commercials on the second floor. The Gramm company objected strongly to

(Upper) Exterior view of New Grand Central Palace. (Lower) Grand stairway leading from street level to main floor

(Upper) View of the colonnade on the main floor, showing detail of pillars.
(Lower) Looking toward head of grand stairway from main hall

this arrangement, claiming that the space awards should have been based upon the number of shows that the companies had participated in and the amount of business done by them.

The protest having been overruled, the company selected a prominent space at the corner of the open court.

As compared with last year, the situation was a love-feast. Represented at the drawing were prominent members of the trade, who formed the backbone of the independent movement in the past, discussing positions in the exhibition hall with the wheel-horses of the parent organization. Every concern that makes good automobiles was sought for and their representatives responded in large numbers to the call.

Some of the spaces secured on the main floor by concerns that are just making their début are notable for their size and position. This is particularly true of the Hupp Corporation and the Stutz.

The building fronts on Lexington avenue and is twelve stories high. Around the top pair of stories is a collonade effect that gives a Moorish ascept to the structure.

Entering from Lexington avenue, visitors ascend a broad stairway to the main floor. From the top of the stairs the hall stretches away for 200 feet to the rear wall of the building. To left and right are the passenger elevators flanked by prominent exhibition spaces. Back on the Lexington avenue end of the room, extending from one wall to the other there are show spaces. but the solid body of exhibitors will be ranged about the great hall between the top of the stairs and the Depew Place side.

The tone of the interior is white combined with cream, the latter color being furnished by the stone work in the pedestals of the pillars and in some of the painted surfaces. The lights are set into the ceiling in such a way as to avoid glare and at the same time shed an ample volume of radiance. The whole floor is a giant quadrangle, surrounding a smaller one, in the form of an open court of great size, situated well toward the rear. This court is open to its full width as far as the ceiling of the second floor and pierces to the top of the third floor in reduced dimensions. Ranged in pairs, laterally through the hall, are two series of pillars of monumental size and massive beauty.

Besides these there are numerous pillars of smaller size in all parts of the building. These serve to support the exceedingly heavy structure and are not unsightly. But they do serve to cut up the hall and they do obstruct the general view.

The available space on the second floor is less than on the main or the third floors, this being due to the space lost on the second floor by reason of the open court. However, this is partially balanced by the space gained over the stairway. The third floor is still larger because the court is reduced to small size and it constitutes the only break in the floor which measures 194 by 268 feet.

Near the northeast corner of the building are the freight elevators. The shafts are covered with building material except for the side where entrance and exit to them is had.

The applications for space indicate that about 250 different

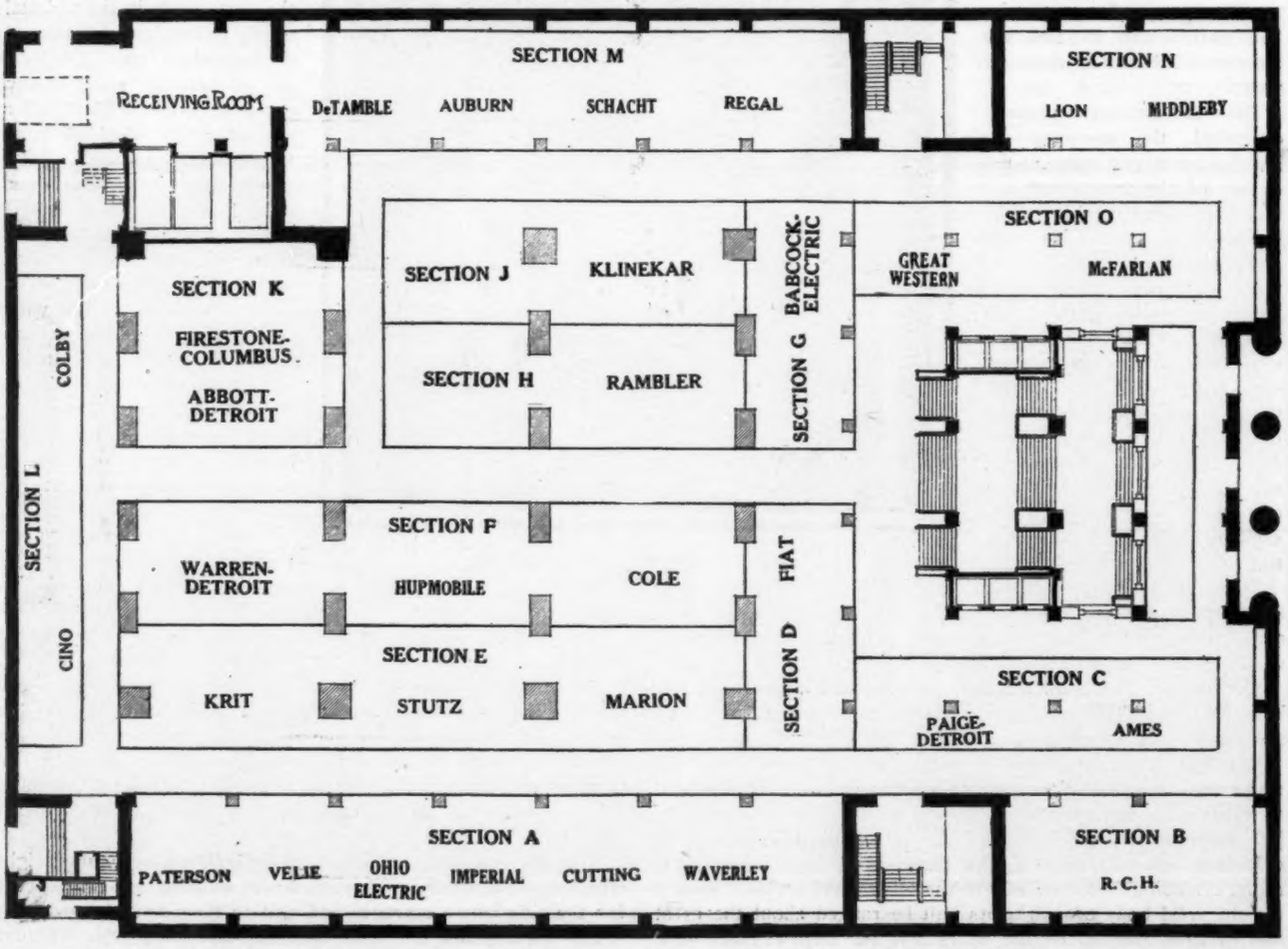
View of the main hall of the New Grand Central Palace, looking across the Colonnade

models will be shown. The exhibitors sought space to accommodate from 2 to 8 cars and 55 bidders were located in the building. There will probably be a dozen additional exhibitors, thus making four the average number of cars displayed.

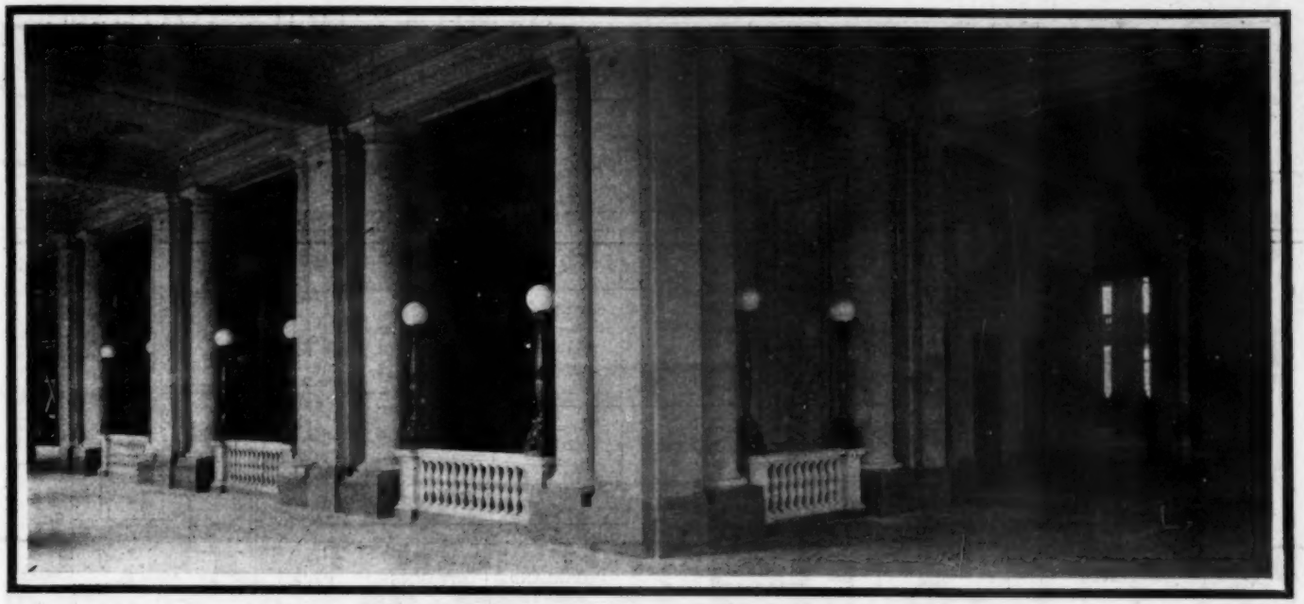
The plan for decorating the interior is still unsettled. As the building stands it requires very little in the line of beautification and it has been practically decided that simplicity will prove more effective than ornateness.

The building is being used this week for the electrical show and the promoters have been exceedingly sparing of decoration. The effect is very good.

The executive offices of the company are located on the



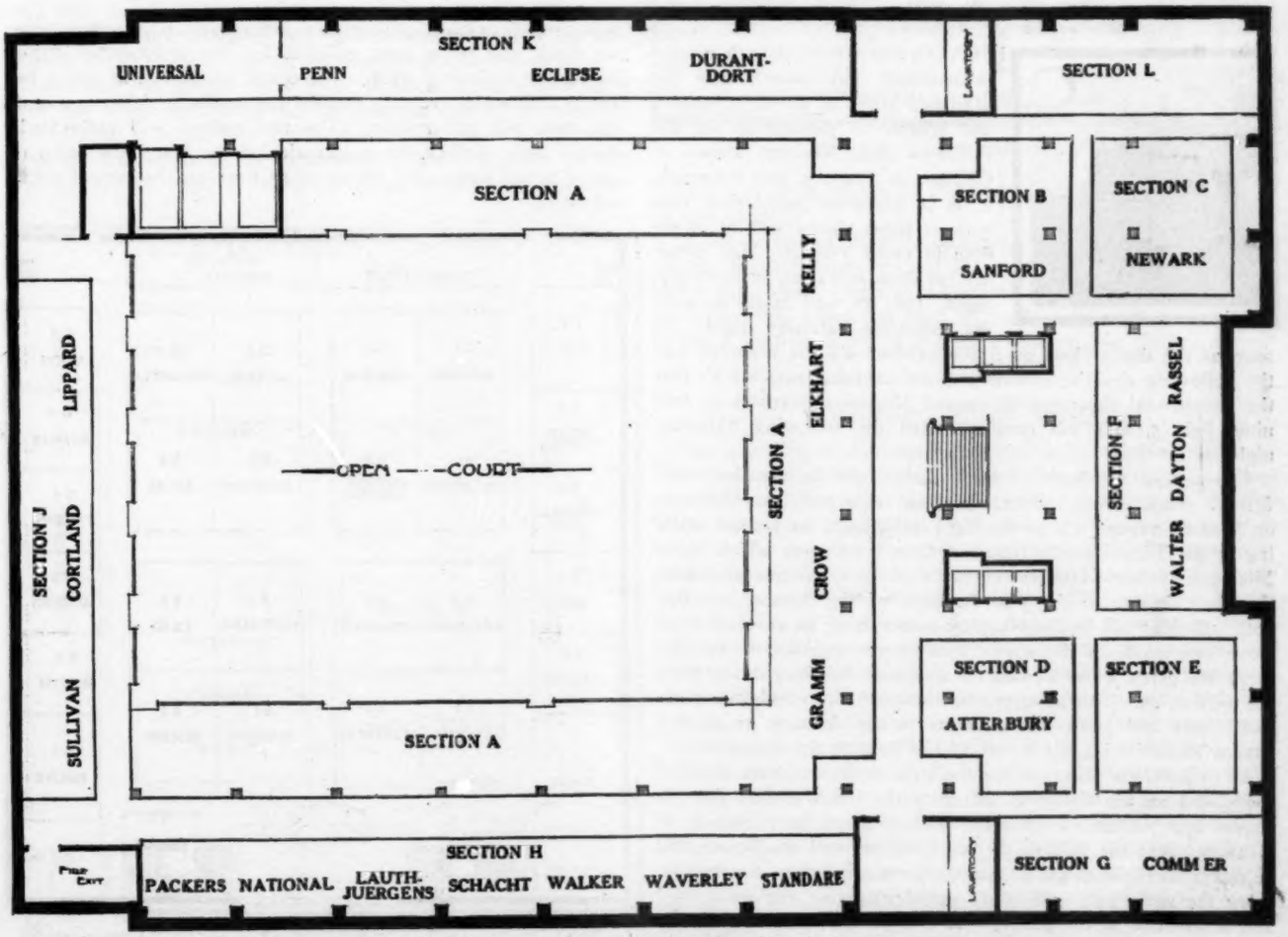
Floor plan, showing how the main floor exhibits will be installed at the 12th annual N. A. A. M. Show in the Palace, Jan. 10-17, 1912



Giving an idea of the decorative effects on the second floor of the New Grand Central Palace

ground floor in the southeast corner and cut off nothing from the main floor, thus diminishing in no way the available exhibition space.

The floor space of the exhibition part of the new Grand Central Palace is something over 120,000 square feet. This total is considerably greater than the exhibition space of any other building devoted to shows in the United States. Despite this fact, the division of the space into three floors and the presence of so many pillars in each does not give the effect of such a vast amount of room. The architectural impressiveness of the main floor is not carried out in the upper floors of the structure in the same measure.



Plan of the second floor exhibits at next winter's N. A. A. M. show in the New Grand Central Palace

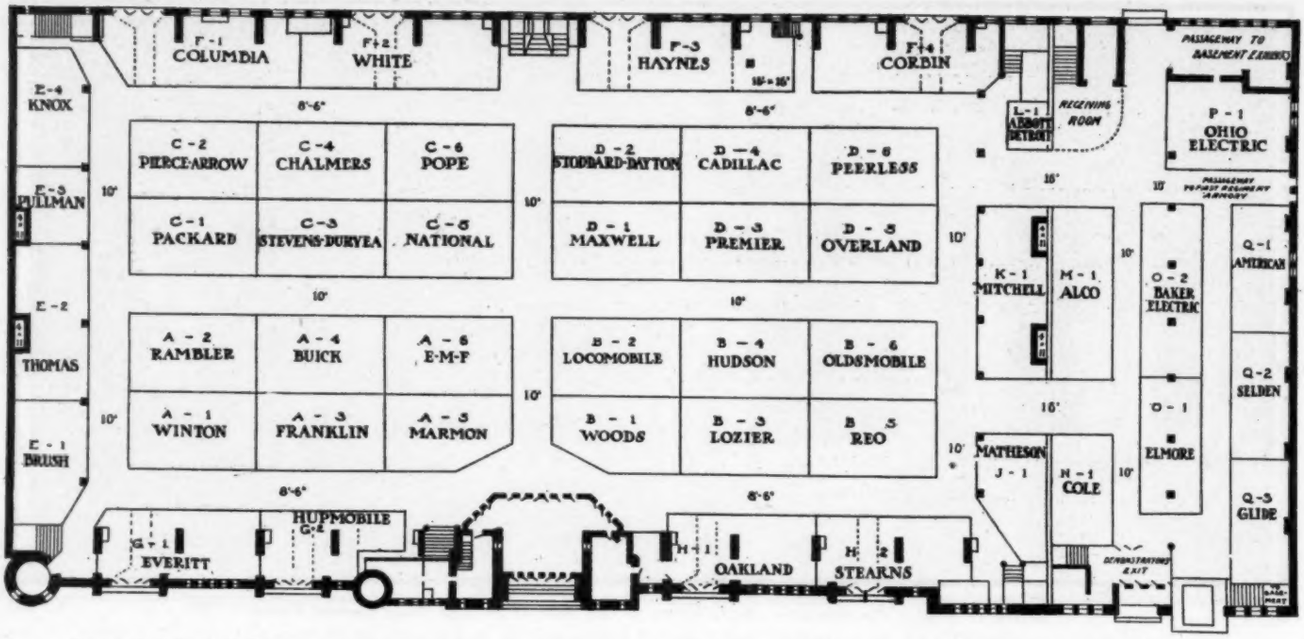


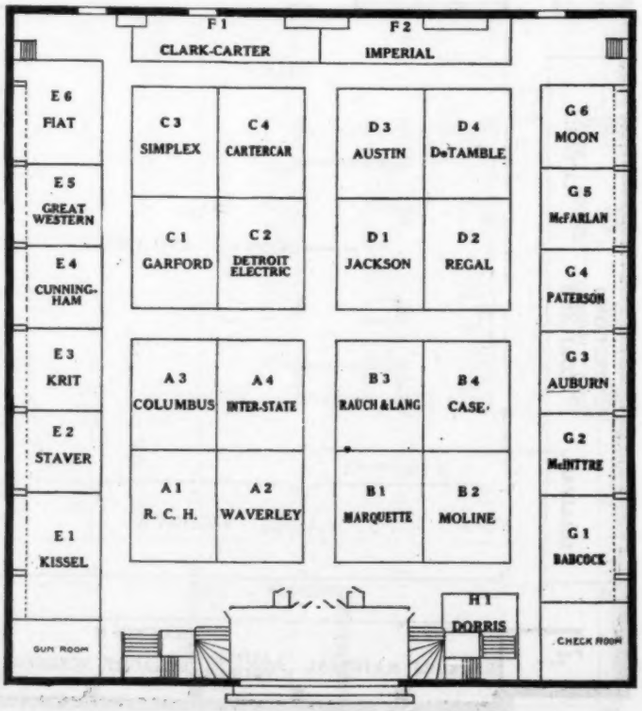
Chart of Chicago Coliseum and Annex, showing where pleasure cars will be located during N. A. A. M. Show, Jan. 27 to Feb. 3, 1912

The N.A.A.M. Shows at Chicago

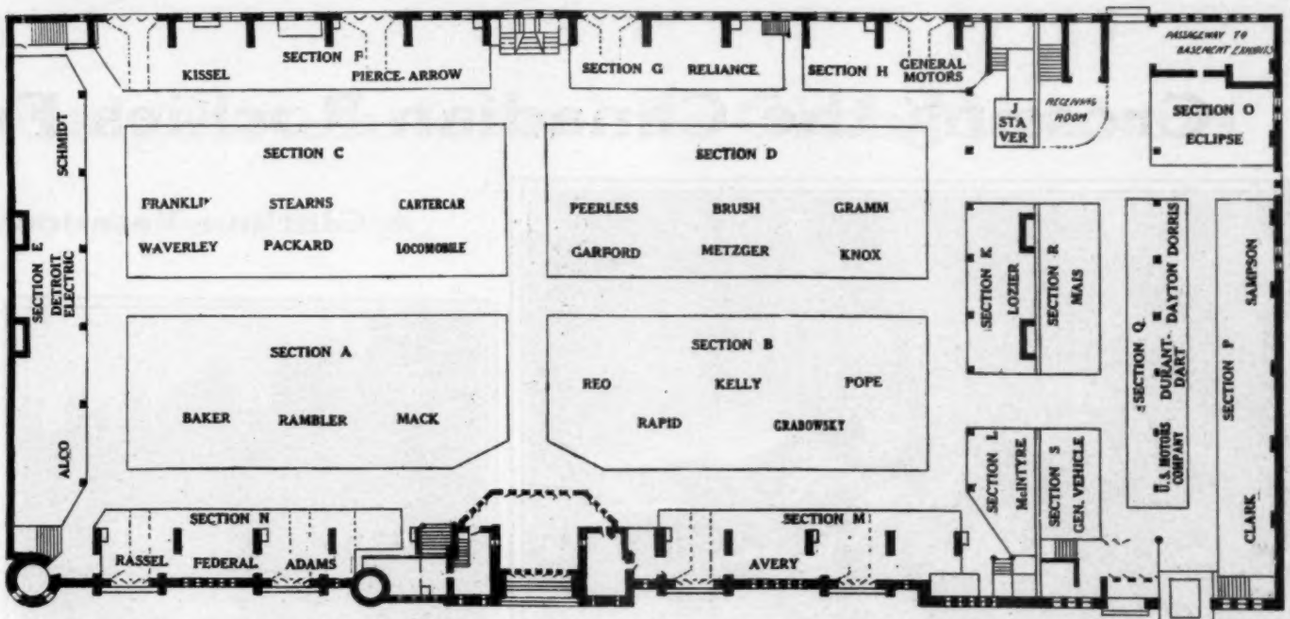
CHICAGO, Oct. 10—Although no announcement has been made by Manager Miles as to the principles and scheme of decoration for the Coliseum and Armory shows in Chicago in January and February, it is a foregone conclusion that both of these shows will be up-to-date in every respect. The pleasure car show will open on Saturday, night, Jan. 27, and continue until the following Saturday night. As soon as the doors close on it the exhibits will be removed and the following day the commercial car exhibits installed so that the commercial show can be opened Monday afternoon or evening, Feb. 5, and will continue until the following Saturday night.

The setting for both of these shows will be identical with former years. Two buildings will be required. The Coliseum on Wabash avenue will be the big exhibit hall; the second building is the First Illinois National Guard Armory, which is on Michigan avenue. The rear entrance of the Coliseum opens onto the alley leading to the rear entrance of the Armory, so that both buildings can be combined by constructing an enclosed walk along one inside of the alley. Tickets of admission to the Armory are given when leaving the Coliseum by the rear entrance and *vice versa*. This arrangement makes the two buildings practically one and gives the exhibitor in the Armory as good a chance at exhibiting his wares as his rival in the Coliseum.

As in previous years during the first week, the main floor of the Coliseum, the Coliseum annex to the south end of the Coliseum and the annex basement will be given over entirely to pleasure cars; the gallery of the Coliseum and the annex will be placed at the disposal of accessory manufacturers. In the Armory the same rule will hold; namely, cars on the main floor and accessories in the gallery. It is expected that the majority of the accessory exhibitors who will show during the pleasure car week will leave their exhibits for the commercial display during the following week. There will be, of course, not a few whose accessories are not intended for trucks or delivery wagons and they will not remain. The tire makers will undoubtedly change their exhibits, the pneumatics of the first show being replaced by the huge solid rubber truck tires for the second week's exhibition.

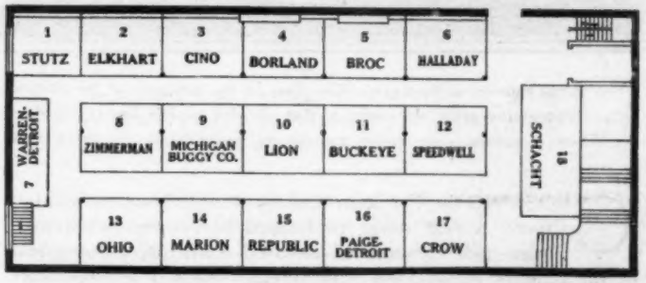


How pleasure cars will be distributed at the First Regiment Armory

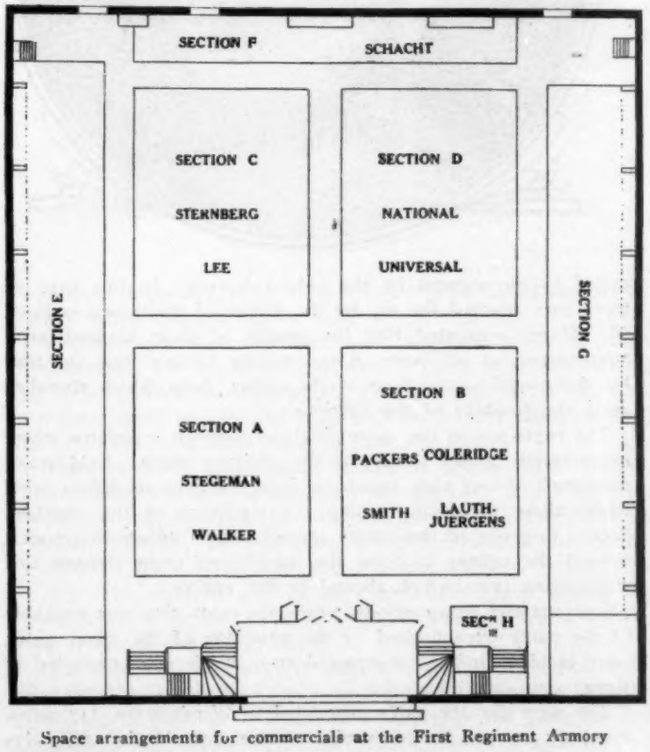


Arrangement of commercial cars which will be exhibited during the show in the Coliseum and Annex, Feb. 5-10, 1912

The Chicago show has since its inception been a wide-open exhibition and will be so for the coming year. In the days of the A. L. A. M., when New York had its licensed show in one place and its independent show in another place, these licensed and unlicensed makers were exhibiting side by side in the Coliseum or Armory; and next year the Board of Trade members will be side by side with those who are not members of this organization. Barriers are entirely removed; it is an out-and-out national show. In the selection of exhibit spaces priority of selection has always been given to those makers who have been the oldest exhibitors at the Chicago shows. Because of this scheme it is possible for nearly all of the old companies to group themselves on the main floor of the Coliseum. In this way one of the smallest makers is often lined up against some of the biggest producers of high-priced automobiles to be found in the country.



Plan of basement of Coliseum and layout for pleasure cars



Space arrangements for commercials at the First Regiment Armory

In the matter of show decorations, Manager Miles has always shown special versatility and a good scheme is anticipated for the coming show. He was the introducer of the uniform scheme of decoration, which has been adopted all through America and is being used in many of the big exhibitions in Europe.

Chicago Show Week

CHICAGO, Oct. 9—Chicago is trying an experiment this week which, if successful, will be copied by other cities. Affairs somewhat similar to it have been held, but no other city has such a stage as is afforded by the local motor row, 2 miles in length. The experiment is the fall opening of the Chicago Automobile Trade Association, which has taken the form of a combination outdoor and indoor display. The exterior of the show consists of Michigan avenue, decorated at night by countless numbers of incandescents strung crosswise of the street and with handsome lighted posts at each corner. The stores are decorated uniformly with autumn leaves, potted palms and flags and, taken as a whole, the row presents a handsome appearance.

Nearly every concern has on view the 1912 models and every effort is made to bring out the crowds at night, when the stores are kept open until 10 o'clock, the idea being to get the names of prospects who can be worked on during the dull months of Winter. To encourage the people to visit the row the Trade Association is running a trackless trolley made up of demonstrating cars which carry spectators from one part of the row to another, provided they secure tickets from some agent, who takes the name before handing out the pass.

Crossing the Canadian Rockies Feat

A Glorious Vacation Trip

1—At the summit of the Crow's Nest Pass on the backbone of the continent
2—Some of the going was equal to that afforded by fair country roads
3—Where a boiling trout stream has cut its way through the living rock

CROSSING the Canadian Rockies from Calgary to Windermere, a feat never performed heretofore in automobiles, two carloads of tourists, consisting of members of the Calgary Automobile Club, recently enjoyed an experience that was glorious.

They spent three weeks on the trip and only traveled 1,133 miles, but for eight days the party camped and fished the streams and lakes high in the heart of the mountains. According to Herbert Mapes, one of the party, the roads and trails were extremely difficult, but the magnificent scenery and the pleasure of the trip more than repaid the pains and trials that were suffered through the racking of the bad roads.

Guns, fishing tackle and a complete camp outfit were carried. The largest mileage made in any day was 128 miles, the distance from Calgary to MacLeod. After getting up into the hills the average distance traveled each day was about 50 miles and on several days the route traversed was cut down to 25 miles.

Leaving MacLeod the way led past the little city of Frank, B. C., where once stood another village of the same name. Deep under boulders and earth that slipped upon it from the mountain tops the former village and 80 of its inhabitants are buried. This part of the route is very dangerous, even to-day, because the formation of the mountain surface is not secure and slides are of daily occurrence.

The next day found the party augmented by another automobile and the three cars climbed the terrific grade and narrow, rutted trail to Crow's Nest Pass, which is at the summit of the continental divide. Looking back from Crow's Nest the party saw streams and brooklets that eventually empty into the Atlantic Ocean, while to the west the watercourses flowing through the broad valley that lies between the Rockies and the Selkirk foothills, trend to the Pacific.

On the very summit the tourists found a house, from which the rain is shed on one side into the Atlantic Ocean and from the other the dripping moisture finds ultimate rest in the Pacific.

Legend says that two other automobiles once tried to surmount Crow's Nest, but sticking in the mud, both had to be towed to the summit by the aid of horses. In this case all three cars reached the top by the power of their own engines. Mr. Mapes estimated that the grades at their steepest pitch approximate 45 per cent. After passing Crow's Nest the trail led downward to the floor of the valley, from which stretched away the foothills of the Selkirks.

The route across the mountains was through a country where inexpressibly grand scenery is the ordinary thing. Bald crags, thousands of feet high, stand out from the grim mountain sides, while along the trail, turning the blackness of the highland lichens to green are numerous springs and brooklets that trickle toward the valleys to form the tumultuous trout streams and shimmering lakes which abound in this region.

Canyons and heavy woods, where the most vivacious members of the party were hushed by the grandeur of the silent pines, were incidents of the downward trip, which was concluded at Krag.

The next day the party proceeded to Windermere, 117 miles, requiring over 12 hours' steady running, and the following day

# of Calgary Automobile Club Members

Over Continental Divide

4—In reaching Lake St. Mary's the cars had to traverse this road
5—Just before Waldo, new road construction was passed by the party
6—Less than two hours to midnight this picture was taken near Krag

was spent in making an ineffectual side trip to Horsethief Creek, where it had been intended to camp for several days.

This was not done, however, and camp was made on Lake Windermere for the next four days. There was little fishing to be had, and after enjoying the fun of living out in the open for that period of time the party entrained again and proceeded to Cranbrook and from there to Lake St. Mary's.

The return trip, which really should be figured from Windermere, was somewhat longer than the outward bound journey. After leaving the lake the way was through Cranbrook, Fort Steele, Wardner, Baynes Lake, Elko, Morrisey Hills, Fernie, Hosmer, Crow's Nest, MacLeod and into Calgary.

The trip required just 21 days and was staged among the most beautiful scenery to be found in Alberta and British Columbia, if not in the whole world.

The cars used by the party were a Cole and a Stearns, while the car that joined the Calgary tourists before reaching Windermere was a Hudson. On several of the days the party covered too much territory to enjoy to the uttermost the scenery.

The perpendicular climb from the west side of the plateau to the summit of the Crow's Nest is 610 feet and the cars made it in 20 minutes over a trail barely wide enough for the tread of the wheels, and at the top found the way down blocked by a load of coal, which was being dragged up to the summit of the pass by a 4-horse team. In order to get around this obstacle the wagon had to be hauled out so that its wheels on one side touched the edge of a precipice bounding a 90-foot drop. The animals were then unhitched and by dint of tight squeezing and the loss of some paint from the tonneaus the cars managed to pass.

There was not a single unpleasant incident during the entire trip, if one may disregard the meeting with the coal team. The tourists enjoyed every minute of it, and all declared that they intended to repeat it next Summer.

Southland Calls to the Tourist

So powerfully has the Wanderlust caught the motoring public that inquiries have already begun as to the delights of a tour to the Southland.

And the answer is that the trip makes a real experience and a pleasant one. The South has awakened in some measure to the importance of good roads, so that occasional stretches will prove excellent, while the average roads are tolerable. Two routes in the Automobile Blue Book have been very fully detailed in the 1911 edition, Volume 3, and no tourist should attempt the trip without it. One of these routes is known as the National Highway and the other as the Capital Highway. More parties than the uninformed would suspect have made the trip.

Of course the great charm of the tour is the scenic beauty of the South. In Virginia "where cotton fields touch the edge of the swamps, where jasmine blooms on the rail fences, and peach trees by every cabin, the cardinal lifts up that voice of the troubadour, so gay, so debonair." In the Carolinas is the glorious belt of pines. And finally, in Florida, is the playground of the motorist.

Pulverized Coal--a New Fuel

Is Thirteen Times Cheaper than Gasoline--Offers Good Inducements for Commercial Work

By Prof. William D. Ennis.

UNDER fairly intelligent operation, and with reasonably good luck, the leading items of running expense in connection with an automobile are fuel and tires. Which of these two is the more important depends upon many factors, such as weight and design of car, roads, speeds, size and type of tires, care in running, etc., but in few applications is the cost of fuel other than an important item.

The fuel in this country is usually gasoline. At a cost of says, 20 cents per gallon of about 140,000 B.t.u. heat value, we buy in gasoline 7,000 B.t.u. for 1 cent. With a thermal efficiency of the motor of 15 per cent. (from heat in fuel to work or power at the tire) we obtain in actual pulling power 7,000 × 0.15 = 1,050 B.t.u for 1 cent. If a fuel were available which afforded this amount of developed horsepower at a cost of 1-6 or 1-7 as much, the expense for fuel would be reduced to 1-6 or 1-7 its present usual rate in the operation of automobiles, and the total cost of running would be reduced in no small degree.

Gasoline is one of the most expensive of fuels, quality considered. About 7,000 B.t.u. are obtained for 1 cent. City gas containing 600 B.t.u. per cubic foot, at $1.00 per thousand cubic feet, gives only 6,000 B.t.u. for 1 cent, it is true; but crude (fuel) oil at 3 1-2 cents per gallon gives 40,000, and coal of 14,000 B.t.u. heat value at $3.00 per ton gives 93,000, or 13 times the return from gasoline. The railway locomotive uses such coal; the automobile is handicapped by the necessity of using gasoline.

Commercial Uses of Pulverized Coal

This seems to be solely a question of convenience. High-priced fuels are sometimes used on account of their small bulk, as when a warship employs fuel oil at twice the cost of coal, because a cubic foot of such oil may weigh 60 pounds and represent, potentially, 1,250,000 B.t.u., while a cubic foot of coal weighing 50 pounds, would yield only 700,000 B.t.u.—little more than half as much.

In certain industrial applications, where conveniences or control of combustion necessitates the use of fuels other than ordinary coal, there is keen competition between liquid fuel, natural gas and pulverized coal. Natural gas is not everywhere available, and the supply is everywhere decreasing. Liquid fuels, in this part of the country, cost on the average, per available unit of heat, about twice as much as pulverized coal, which is consequently largely employed in cement burning and for various heating furnaces. A fourth competitor, which seems destined eventually to supersede this fuel, is industrial gas; but excepting in blast furnace work, this has not yet been developed to any extent.

Powdered coal is coal which has been so finely ground that it looks and acts not unlike gunpowder. The coal selected for pulverizing is usually a high grade, highly volatile and fairly dry bituminous—one which along the Atlantic seaboard sells at a rather high price. Contrary to a prevailing impression, pulverizing is not likely to provide a method for utilization of the waste products of the mines. The grinding is usually expected to reduce the coal to 60 or 80 mesh; sometimes to still smaller size. The pulverized product is irregularly inflammable. A lighted match, thrust into it, will be extinguished; but a floating fog or cloud of the dust in a badly ventilated room may ignite and burn explosively in consequence of accidental local overheating or of contact with spark or flame. Several accidents have occurred from such causes.

Combustion of Powdered Coal

In a furnace this fuel acts like gas or oil, giving an intensely hot, pervasive and controllable flame, which may be easily adjusted to develop maximum combustion efficiency. Like all soft coal, it burns with a long flame; but smokelessness is possible without special combustion chambers unless the load is heavy or rapidly variable. The stream of coal is swept or blown into the furnace and is of course quite invisible. If allowed to strike a bridge wall or arch, the localized high temperature and blowpipe action are highly destructive.

The ash (from such a soft coal as is usually employed for pulverizing), is a heavy fine powder, for which there are applications in the arts. In clinkering habit it resembles the ash from the unpulverized coal. If a fuel is used the ash of which does not clinker in ordinary operation, it will not clinker after pulverizing. If an automobile can run 14 miles on 140,000 B.t.u. of gasoline, using, say, 1-2 pound of gasoline or 10,000 B.t.u. per mile—and the same machine should require (for reasons which will appear) 1 1-2 pounds of pulverized coal (20,000 B.t.u.) per mile—about 0.15 pounds of ash would be produced for every mile traveled, or about 1.66 cubic inches. On a 20-foot roadway, for every 10,000 automobiles which passed there would then be deposited an ash layer equivalent to a uniform thickness of 0.0011 inch across the whole width of the road. A long time would be needed to macadamize the road with powdered ash!

This fuel burns without odor and (as has been stated) may be burned without smoke. With an ash production of 1.66 cubic inches or 0.15 pounds per mile (say 0.2 grain per foot), it could also be called dustless.

Relative Efficiencies

The powdered coal weighs about 81 pounds per cubic foot, containing about 1,130,000 B.t.u. A cubic foot of gasoline may represent just about the same heat value; so that from this standpoint there is no difference as regards storage capacity. But if a heat unit from gasoline gives more power than a heat unit from coal, then there is a difference to be considered.

Gasoline is burned in an internal combustion motor, where it may easily develop a thermal efficiency between 15 and 20 per cent. Any immediate application of pulverized coal would have to contemplate the burning of that fuel in a steam boiler which should drive a steam engine, the combined efficiency being probably not much over half that of the gasoline motor. For a given radius of action, then, the room for fuel storage would have to be about doubled if the coal were used.

Pulverizing Processes

For over a century the possibility of an engine using a solid fuel in an internal combustion cycle has been intermittently discussed. Some engines of this type have even been built and run. Solid gasoline is one of the most recent developments along this line. If pulverized coal could be employed directly in the cylinders of an internal combustion engine, it would stand on a parity with gasoline, as far as the storage question is concerned.

In preparing soft coal, it is usually necessary to expel some of the moisture before grinding. A preliminary partial grind-

ing may precede the drying. The object of drying is twofold. It decreases the power consumption at the pulverizer, and it facilitates the handling of the pulverized material, which, if too wet, sticks like a snowball and cannot be easily transported or fed to the furnace by ordinary machinery.

The dryer is usually one employing direct heat, although steam dryers were formerly employed. The expense for fuel does not ordinarily exceed 1 per cent. of the cost of the fuel treated. Some power, also, is needed to rotate the dryer cylinder and to operate the fan which circulates the hot air; the aggregate equivalent of these amounts of power, reduced to a fuel basis, will not exceed one-half of 1 per cent. of the fuel treated in the dryer.

After drying, the coal is reduced to the pulverized condition by one of the many commercial types of grinder, all of which are expensive to purchase and maintain. The original grinding machines were burr-stones or stamp mills. The most perfect apparatus is the tube mill, which is, however, extravagant in power consumption. The centrifugal roller and ring mill is a common type at present; the rolls are sometimes replaced by hardened steel balls which run at high speed in cast metal races. Still another form of mill has radially inserted cutters which shred or tear the coal.

Very few reliable tests have been made on the power consumption for grinding; this varies tremendously with the type of mill, the size and condition of the raw material fed, and the fineness of the product. Roughly, 1 horsepower will grind to an average of 80 mesh from 100 to 200 pounds of coal per hour. In most pulverizers, the powdered product passes over a screen, any coarse particles (sometimes aggregating as much as 30 per cent.) being returned to the pulverizer. In one form, a settling chamber is provided above the grinder proper. From this an exhaust fan draws off the product by suction; its speed being regulated so that the fine particles only are removed from the mill, while the coarse are being returned to the pulverizer by gravity.

The powdered product is usually transported in closed screw conveyors and link belt elevators, and stored in small isolated bins, tightly covered.

It must be fed into the furnace continuously and by some mechanical device which mixes with it the necessary supply of air for combustion. Gravity feed is impracticable, because uncontrollable. In the Schwartzkopf system, the dust is swept in by a revolving brush. Air injectors are also employed; a supply of compressed air is then necessary. A rapidly revolving horizontal screw conveyor itself fed by gravity, is one of the most common devices. In all systems, power is required; the amount of this power is small, but its provision adds some complication; and in many systems an additional fan for supplying air is necessary.

To summarize with regard to the described standard form of equipment, pulverized coal involves an expensive plant, preferably with duplication of units; the total cost of pulverizing and feeding, under ordinary conditions, is from 50 to 60 cents per ton. The fuel is dangerous to handle and store, so that its preparation should be continuous, and pulverizing should be carried on at about the same rate as feeding. With standardization, storage provision may be surrounded with such proper precautions as to make it reasonably safe. A highly volatile soft coal must be employed.

Application to Steam Boilers

In connection with the Aero apparatus, these statements are subject to some modification. Here unit pulverizers are used one directly in front of each furnace. They receive the sized coal just as it comes from the cars and feed the powdered product directly into the furnace where it is to be burned. Even high percentages of moisture may be taken care of in this type of plant; but no doubt at excessive power consumption. The whole process of pulverizing is here carried on in one self-contained machine.

Any finely divided fuel is apt to be burned at higher efficiency than solid coal. Pulverized coal in steam boilers would be on the same basis, with regard to evaporation efficiency, as liquid or gaseous fuel. Its use would largely dispense with the labor of firing ordinary coal, which might under average conditions mean a saving of 20 or 30 cents per ton. If the gross cost of pulverizing be taken at 60 cents and the labor saving at 30 cents, the net additional cost of 30 cents per ton must be contrasted with the thermal saving as between pulverized and ordinary coal. If the latter costs $3 per ton, the 30 cent disadvantage would be just offset by a 10 per cent. gain in efficiency.

The automobile having a steam power plant already uses a liquid fuel, so that there could be no gain in efficiency. Nor could there be any saving in labor expense. In a steam locomotive, these savings might be realized; in part, at least. The independent self-contained type of preparatory apparatus would be necessary, or else pulverizing plants would replace present coaling stations and the locomotive could "coal up" as quickly as it now takes water. It might take on coal even while running. If the power for driving the feeder were derived from the locomotive boiler itself, the latter would cease to be self starting, and outside power would be necessary in order to get the fire going.

The Automobile

Some of these considerations apply with equal force to possible applications of pulverized fuel under automobile conditions. The figures assumed show soft coal to be 13 times cheaper, in proportion to its heat value, than gasoline. If we say that the steam plant to be used is half as efficient as the internal combustion motor (letting this rough estimate cover the cost of preparing the coal), the saving in fuel cost is still 11-13 or 85 per cent. Fuel would need to be taken on twice as frequently as at present. For commercial vehicles, making regular trips, pulverizing stations might be placed at suitable points and this ready prepared fuel discharged into a storage bin under dust-proof connections. In order to start up a cold boiler, a short period of hard feeding might be necessary.

For the ordinary consumer, the charge would be more revolutionary. The self-contained pulverizing and feeding apparatus would be a radical addition to present equipment, one which might prove intolerable. On the other hand, central pulverizing stations with generally distributed supply depots would be hard to inaugurate and would be unavailable unless inaugurated on an extensive scale. The 85 per cent. predicted saving would, however, give an opportunity for considerable profit to both producer and consumer of the fuel.

Should there be developed an internal combustion engine which could use the pulverized coal, the additional saving in fuel would be from present standpoints unimportant; but the maintenance of present radii of action and the possibility of easier arrangement for self-starting would make the fuel more attractive. It seems probable that under such conditions a strong effort would be made to adapt the self-contained preparing and pulverizing apparatus to automobile conditions. Only a small amount of prepared coal would need to be stored; but the unpulverized material for consumption would still occupy about twice the space of the present gasoline supply, so that there would be an enormous addition to the present bulk of power plant.

The outlook for a realization of an 85 per cent. saving in fuel cost by this means is obviously not encouraging, yet this is so large a saving that it necessarily obtains occasional consideration; and it is by no means impossible that we may see stage and trucking lines equipped to burn pulverized coal. Whether this will be in a steam or a gas engine is doubtful. Whether it will involve local coal supply depots and feeding spouts, or coal bins and pulverizers on the automobiles, the answer is also doubtful. It is to be hoped (and, one may say, expected), that a change of the sort, if made, may be made without adding to the present discomfort of machine occupant or passer-by, on the grounds of noise, dust, smoke, odor or any other kind of nuisance.

Quick Methods of Car Painting

By M. C. Hillick.

RAPID transit processes for painting the automobile are being exploited throughout the country and promise to be largely in evidence next year. By temperament and disposition, by the teaching which the use of the horseless vehicle brings to its owner, the latter is inclined to be in a hurry.

This nervous haste follows the car into the paint shop and exacts the greatest possible speed in getting it into a new dress of paint and varnish. This brings us to the question of the briefest method consistent with reasonably durable results.

For the metal body scarcely anything shorter than a 5-day method can be offered, which represents for the first day the work of going over the surface with a coarse rubbing composition stone dipped in benzine or naphtha. Sand blasting the surface, in case of new work such as we are now considering, is the best and surest method of getting the surface free from rust or scale formation; but the sand-blast machine is not always available in the automobile or carriage paint shop, hence the need of some effective hand system which will prove at least a fair substitute for the machine. A stiff wire brush is a very good tool with which to eliminate the rust and foreign matter, but for good work, in the absence of a sand-blast machine, the composition rubbing stone and benzine is a good combination.

Having made the surface clean and receptive, apply a good metal primer, of which there are many being marketed ready to use. All things considered, these ready-to-use primers are cheaper, and, as a rule, more uniform and reliable than those shop-mixed and prepared.

The primer should be dry enough the following day to run over with a thin glaze of hand-drying putty, working the mixture on very smooth and uniform. The morning of the third day sandpaper this putty glaze sufficiently to fetch it down fine and smooth. Then apply a coat of body color, japan ground, and thinned with turpentine to flat out without any gloss. Late in the afternoon of the same day apply a coat of varnish color or glaze color. Late in the afternoon of the day following run over the varnish color with a soft sponge dipped in water and pulverized pumice stone to lay down the gloss and beat off dirt motes, etc. Then apply a coat of rubbing varnish, quick-drying, containing just enough of the pigment to preserve the natural tone of the color.

In the closing hours of the fifth day again water rub, using very little pumice stone flour, wash up and apply a coat of heavy body finishing varnish. During this time the chassis or running parts should be brought along to an equally quick finish.

This sort of finish, however, suffices for only a certain class of trade, and to make a finish acceptable to buyers and users looking for something between the cheapest and the highest-priced it will be necessary to put over the putty glaze at least three coats of rough stuff in due time, rubbing these out with composition rubbing stone and benzine, and using above the color an additional coat of rubbing varnish. This, of course, will lengthen the period for painting and finishing several days, but it will furnish a correspondingly higher class of finish.

Wooden bodies may be finished upon the same schedule outlined for the metal bodies. Upon the former apply a surfacing or glaze material bought ready to use, or made by grinding white lead through a closely set mill and then rubbing it to a working consistency with equal parts of rubbing varnish and coach japan, adding the necessary coloring matter to fetch surfacing base up to the finally selected color.

On the morning of the third day this coat or glazing should be sandpapered down, using the paper over a block, and using for the first sanding No. 1 paper, and for the final dressing down No. 0 paper.

For better surface results omit sandpapering the glaze stuff and apply directly over it, at the rate of two coats per day, four coats of roughstuff. The day following the application of the last coat of stuff rub out with composition rubbing stone and water. Then apply, in case of most colors, two coats of flat color and a coat of varnish color, unless some one of the cake pigments is used, in which case two coats of the varnish color, or glaze color, will be necessary. Upon this, or upon the final coat of varnish color or glaze, after rubbing lightly down with pumice stone flour and water, the striping and ornamental work should be applied. Then follow with a coat of clear rubbing varnish, this in due time to be well rubbed and finished with a stout body of finishing varnish specially adapted to automobile work. This latter is an important item in any system or process of surfacing and painting which may be adopted.

The service imposed upon the varnish of the automobile is by far the most exacting of any to which varnish can reasonably be exposed, the strain upon it being, both during service on the road and in the garage, of an unusual character. Careless methods of washing and caring for the car at garages in which the very life of the varnish is threatened, and, in a measure, taken, constitute the hardest kind of service, being even worse, on the whole, than the blinding dust and the foreign matter settling upon the car in the course of road service.

All methods of painting and finishing the car should be with an eye fixed upon securing with brevity of methods the greatest possible amount of durability, along with an appearance at once neat and effective. It is not always the greatest number of coats of paint and varnish that count for most in the matter of appearance and wearing capacity. Fewer coats, and better drying and application of such coats, will insure for appearance and durability something which less careful methods and any amount of paint and varnish must fail to supply.

Big Oil-Burning Motors for Commercial Use—The largest Diesel motor so far constructed anywhere is of the two-cycle type and develops 2,000 horsepower at 167 revolutions per minute. It has been installed, together with a Diesel motor of 1,000 horsepower, by the Electrical Society of Saint-Chamond, which has heretofore received all its current from a water power plant in the Alps Mountains.—From *Le Génie Civil*, July 29.

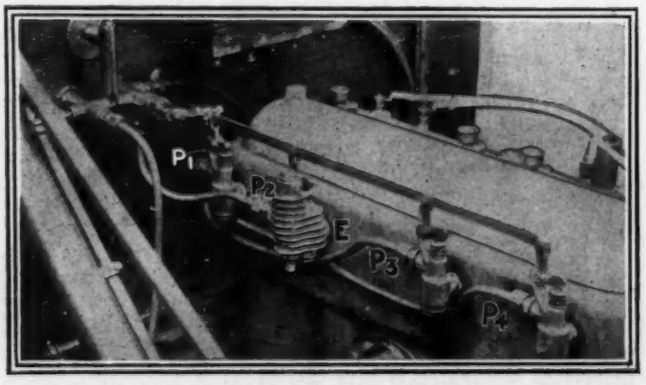


Fig. 1—Showing right-hand side of Everett motor, with self-starting device attached

Novelties in Self-Starting Devices

DISINCLINATION to work any harder than necessary has put the average motorist on the *qui vive* for anything new and promising along the line of self-starting devices. One of the more recent inventions having this object in view is that forming part of the regular equipment of the 1912 Everitt six- and four-cylinder models. This may be briefly described as of the compressed-air type, operated by a push-button on the dashboard. The supply of air pressure is taken from one of the cylinders on the explosion stroke, and in the case of the four-cylinder motor, shown in Fig. 1, it will be seen at E on the third cylinder.

The air-pressure storage tank can be filled by running the motor for five or ten minutes, after which the pump is automatically shut off. A selector valve, or distributor, operating on the same principle as an electric timer is directly connected with the camshaft. As the engine revolves this distributor exposes, in turn, four openings for the four cylinders, and air pipes P1, P2, P3 and P4 are led to each of the cylinders. The timing is so arranged that the air pressure from the tank passing through the distributor is admitted first to the cylinder which is at the top of its stroke.

A needle valve V1, Fig. 2, is provided on the dash for the purpose of closing the tank and connection when the car is left for the night, or for any length of time, the object of which is to guard against any possibility of leakage of air pressure from the tank. The gauge G1 registers the amount of pressure available for starting the motor. When it is desired to start the motor, provided the needle valve is open, it is necessary to press on the push-button B in Fig. 2, which releases the air pressure stored in the tank, and, passing through the distributor, forces one of the pistons down, thereby causing the crankshaft to rotate. The distributor in turn opens the next valve and so on, rapidly turning the engine until the latter takes up its cycle of explosion. The pressure of the knob, besides releasing the compressed air from the tank, opens the valves that are fed from the distributor. These can be clearly seen in Fig. 1.

GOODHART STARTER—Another recent example along the same lines, this time from across the water, is known as the Goodhart engine starter. The device consists of a helical spring mounted on the clutch shaft, Fig. 3. This spring is wound up by the motor, which it subsequently restarts by being released. The shaft AB is cut in two and the half carrying the clutch is keyed to the boss A1, having dogs, which engage with others upon a ring C. This ring has a peripheral ratchet wheel, which can be slid along the drum D through the medium of keys D1, thereby sliding the teeth of the wheel in and out of engagement with the pawl F mounted upon some fixed part of the chassis. The drum D contains a flat helical spring, the outer end of which is fixed thereto and the inner end to a flange B1, which is keyed to the transmission half of the clutch shaft.

The drum also carries two dogs D2, which allow of a little less than one revolution being made before they bring up against two similar dogs B2, on the flange B1. The loss of the flange

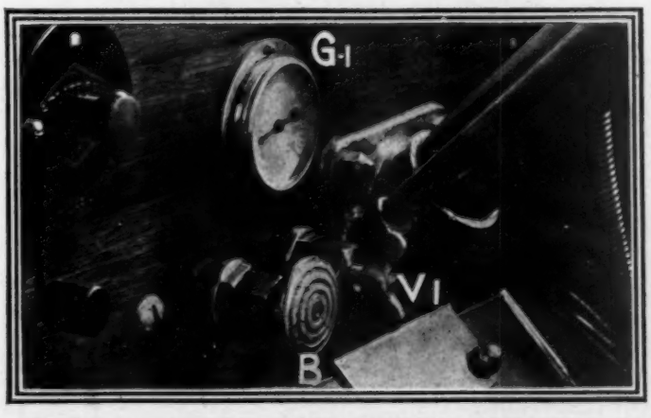


Fig. 2—Dashboard of the Everitt car, showing the disposition of control mechanism

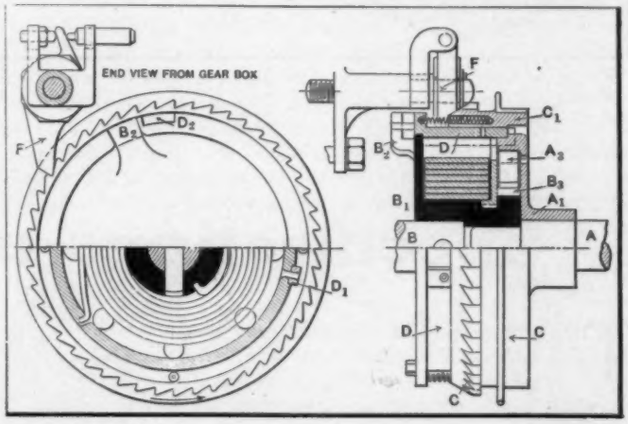


Fig. 3—Sectional view of Goodhart engine starter, an English invention

B carries a ratchet B3, which is held by a pawl A3 fixed to A1. When a load is put upon the clutch shaft through the engine driving the car the drum, with one end of the spring attached to it, rotates and winds up the spring until the dogs D2 and B2 come into contact with one another, when the whole device, being solid, transmits the power in the usual way. The spring having thus been wound up, is retained in this condition by the pawl and ratchet B3 and A3. To start the engine a pedal slides the ratchet ring until it engages with the pawl and also causes the dogs C1 and A2 to disengage.

The spring is then free to unwind and rotate the clutch shaft through the medium of the ratchet and pawl B3 and A3. The pedal being released, the ratchet slides back to its normal position and the spring is again wound up as described above. Some tests were carried out under the control of the Royal Automobile Club, which were satisfactory while the motor was warm, but which failed when an attempt was made to start the motor when it was cold after standing all night.

This may have been due to the make of car, which had automatic intake valves and battery ignition. When the engine was warm it was found that the pull of the contrivance was sufficient to cause the engine to make three complete revolutions.

TO FLY OR NOT TO FLY: THAT'S THE RUB—Intermediate forms have wiped out the sharp distinction between monoplanes and biplanes, and the world is returning to its first classification of flying machines—those which fly and those which don't.—*Pierre Maillard.*

MOTORPHOBIA OR PHILANTHROPY—Switzerland, accused of motorphobia in her somewhat radical road regulations, retorts that it is not motors but motorists she loves less and the plain humans she loves more.

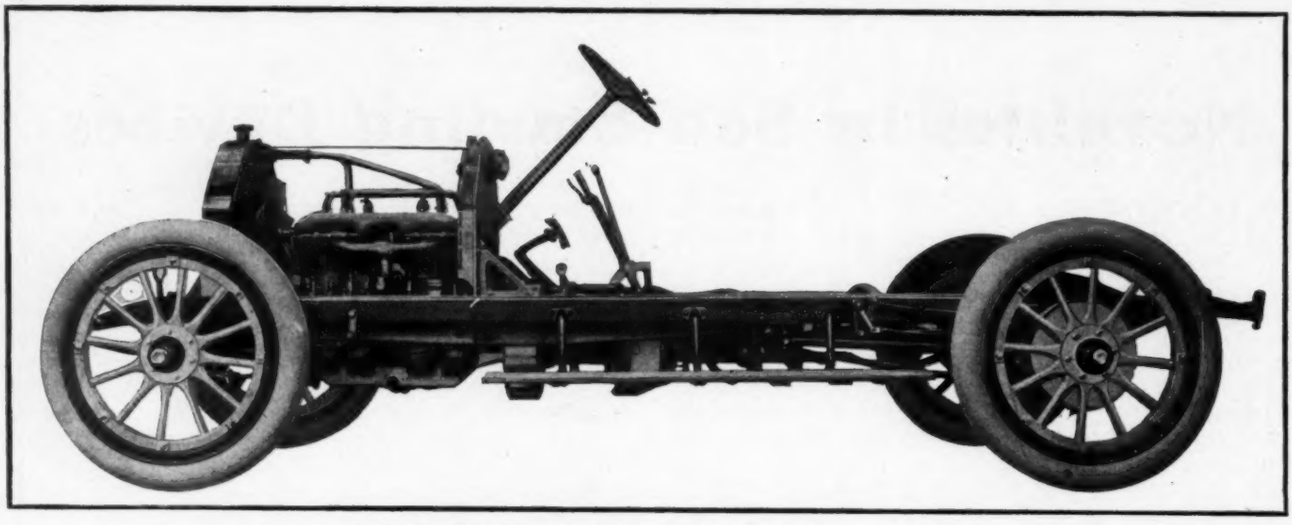


Fig. 1—The standard chassis of the Speedwell line, used with all types of cars

Specifications of the Speedwell

THE chassis used in connection with the 1912 output of the Speedwell Motor Car Company, of Dayton, Ohio, will be fitted with twelve different styles of body. The same chassis is used throughout and is equipped with a standard power plant.

The Speedwell motor is a four-cylinder four-cycle product, with the cylinders cast in pairs. The castings are of the L-head type, the valves all being on the left-hand side of the motor and the exhaust and inlet manifolds M and N, Fig. 8, being placed one above the other. The lower manifold N is the inlet. The manifolds are held in place by means of dogs and stud bolts. The waterjackets are cast integrally with the cylinders, but are fitted with removable heads to allow of inspection and cleaning.

The pistons are of gray iron finished from the casting by grinding to a fit and equipped with four piston rings which are hand finished to insure accuracy. This process of manufacture is a longer one than by turning the rings out entirely by machinery, but there is a gain in the fitting of the part when made in this manner.

The valves are interchangeable throughout the motor and are all directly operated off the same camshaft. The valve tappet guides G extend a liberal distance above the crankcase and are detachable by removing the nuts, which are screwed directly into the top of the crankcase. Above the valve tappet guides are the valve rod adjustment nuts, by means of which the valves may be kept properly timed after they are ground or otherwise adjusted. Above the adjusting nuts are the spring seats upon which rest the valve coil springs S. The camshaft is driven through a set of gears at the front end of the motor, the drive passing through an intermediary wheel N, Fig. 6, before being transmitted to the camshaft gear wheel T. This intermediary wheel is the same size as the camshaft wheel, being twice the size of the gear L on the end of the crankshaft.

The remaining wheel O in the timing gearcase is of the same size as the gear on the end of the cranks and actuates the shaft which drives both the magneto M, Fig. 7, and water pump P. This shaft runs along the right-hand side of the motor and drives the fan pulley just after passing through the end bearing of the shaft. Just behind the fan pulley there is a coupling; the shaft then passes to the water pump and fan. The lengths of shaft adjoining the magneto and pump are removable so that either of these parts may be taken out independently of the other, this being effected by means of adjustable companion flanges. The gears which drive these shafts are all of helical cut, a feature which tends to avoid noise.

The crankcase is a two-piece casting of nickel-aluminum alloy, the upper half being entirely separate from the lower. The two cylinder blocks are fastened to the crankcase by means of heavy

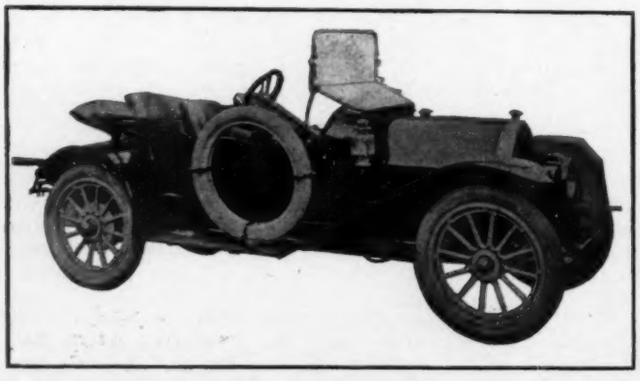


Fig. 2—Showing the Speedwell three-passenger "duckboat"

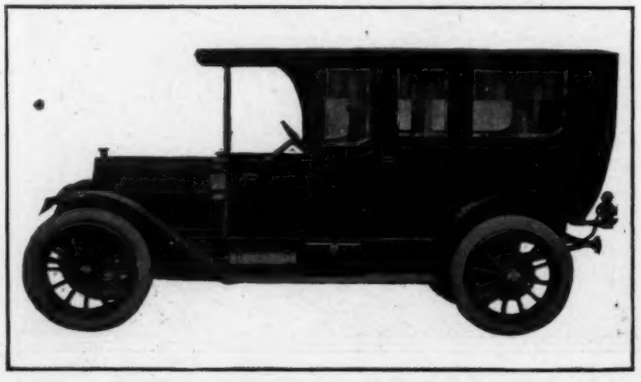


Fig. 3—The Speedwell seven-passenger limousine

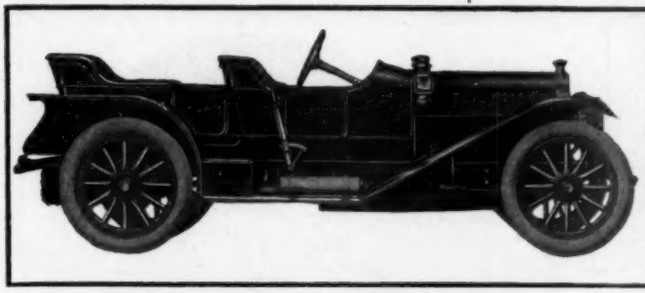


Fig. 4—Showing the Speedwell demi-tonneau

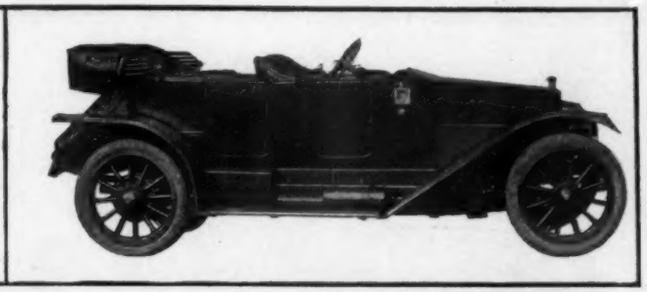
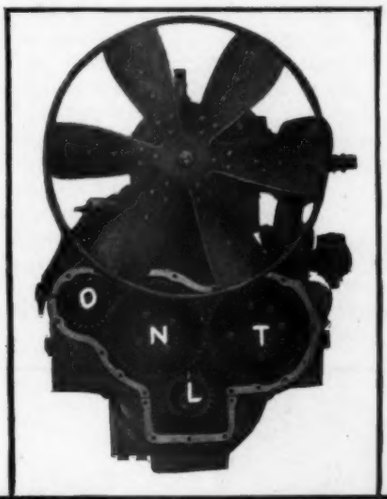


Fig. 5—Speedwell "cruiser," which sells for $3,500

holding down bolts which pass through a broad flange on the base of the cylinder castings and through the crankcase. The casting is so formed that a seating is furnished for each of the valve tappet guide nuts mentioned above, the timing gear casing being also a part of the casting. The cover of the gear housing is removable so that easy inspection of the timing gears is afforded. The motor supporting hangers are cast with the upper part of the crankcase so that the lower half may be dropped entirely by merely removing the bolts which support it and by this means access may be had to the cylinders, pistons, camshafts, crankshaft, connecting rods and wrist-pin bearings.

The crankshaft is of heat-treated alloy steel and is supported upon three plain bearings of good length. The bearings are lined with double white bronze bushings and are located at the ends of the crankshaft and between the two pairs of cylinders. In balancing the crankshaft, the flywheel is bolted thereto and then weighed upon a special instrument made for the purpose.

The lubrication of the motor is effected by means of the splash system. The oil is carried in the lower part of the crankcase, which is divided in such a manner that it consists of two parts. The division is made by a horizontal partition which is placed in the lower half of the crankcase and forms the basis for the troughs used in the splash system as well as the top wall of the oil reservoir. The oil is carried beneath the horizontal partition in the lower half of the crankcase, which has a capacity of about 2 gallons. The oil is supplied to the crankcase reservoir by means of a filler hole F, Fig. 7, on the side of the crankcase. This filler hole is provided with a cap which, when removed, discloses a screen through which the oil is poured when filling the crankcase. The height of the oil in the reservoir is determined by means of a float level gauge on the same side of the motor as the filler hole so that in filling it is not necessary to spill oil on the exterior of the motor, for by watching the gauge it is easy to determine the amount of oil in the crankcase. A gear driven oil pump takes the oil from the base reservoir and leads it to a sight feed which is located on the dash in easy view of the driver. All the oil which passes through the lubricating system of the motor must pass through this sight feed, so that the driver has always an accurate knowledge of the condition of the oil in the motor.



After leaving the sight feed the oil is led to the crankcase through a distributing pipe. The distributing pipe leads to the splash troughs in the upper part of the base casting of the motor.

The motor is cooled by water which is forced through the jackets by a centrifugal pump mounted as described above. The jackets are made of good width and thus aid in an easy circulation. The water intake manifold is on the right-hand side of the motor, the water outlet being at the top of the cylinder castings. The latter consists of a siamesed pipe which runs from the top of the cylinder waterjackets to the top of the radiator, the junction of the two pipes taking place at a point just

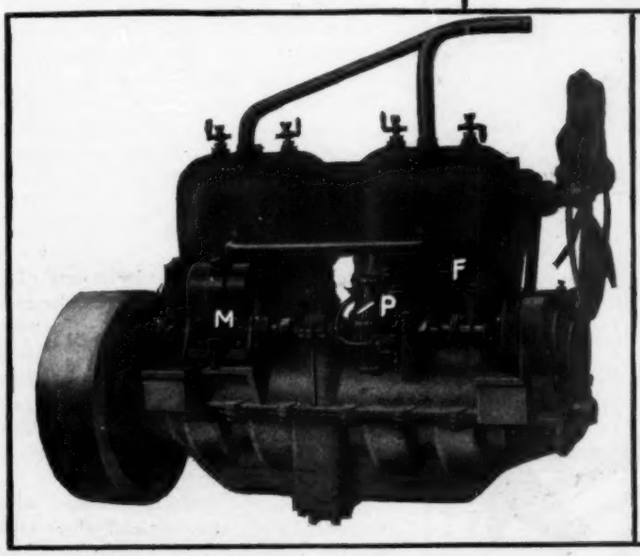


Fig. 7—Magneto side of Speedwell motor

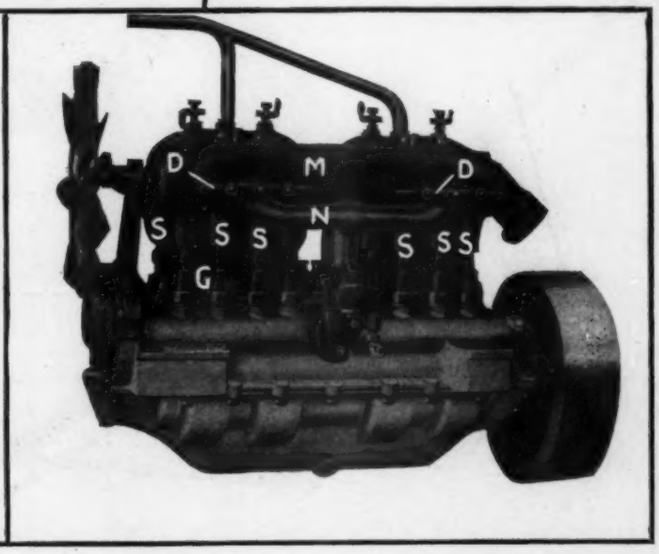


Fig. 8—Showing manifolds and valve actions of the motor

Fig. 6—End view of motor, showing timing gears and fan

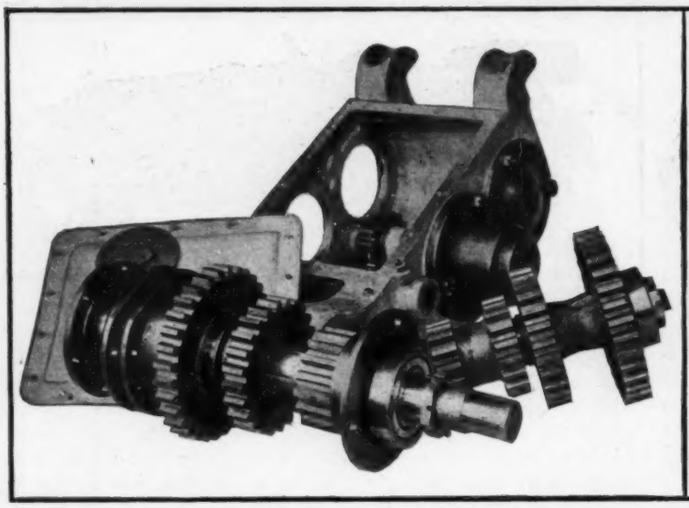


Fig. 9—Disassembly of the gearset

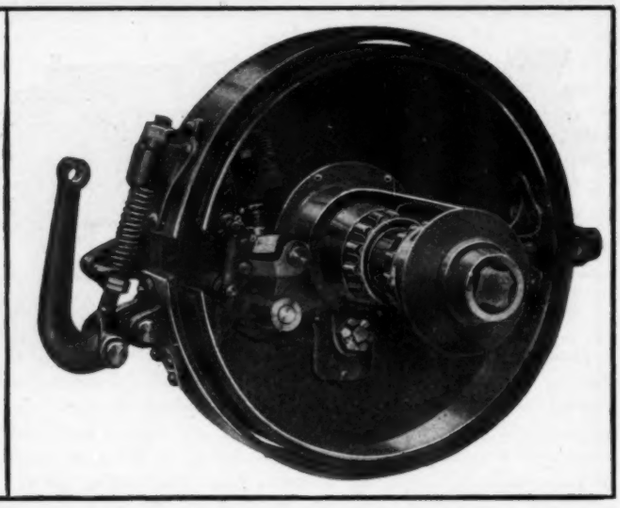


Fig. 10—Showing the brake mechanism

above the center of the foremost pair of cylinders. The radiator is of the Speedwell type and is of cellular construction. A feature of the radiator is that the cells are of square section and that the water circulates in all four sides of each cell. The radiator is cooled by a six-blade fan which is driven by a belt off a pulley located on the pump and magneto shaft. The belt is adjustable so that any stretch may be readily taken up.

The carbureter is hot-water jacketed and is held suspended from the T-shaped inlet manifold. The throttle is augmented by an adjustable cam which controls the opening through which the gasoline passes into the mixing chamber. When the throttle is opened this passage is enlarged. The auxiliary air valve is entirely automatic.

Ignition is accomplished by means of the Bosch dual system. The high-tension magneto is located as has been described. The magneto furnishes the running current while the battery set, which is also provided, furnishes the current for starting the motor. One coil and a single set of spark plugs are employed for both systems. The coil is of the non-vibrating type and is set in the dash so that it is readily accessible from the driver's seat. The appearance presented by the coil is merely that of a circle of 4 inches in diameter. A self-starting button and kick-over switch are fitted on the dash. The timer is not required for this system since it is an integral part of the magneto.

The clutch is of the leather-faced cone type, fitted with a spring engagement so as to insure an easy take-up in starting. The clutch is provided with a ball thrust which is contained in a dust-tight housing. As soon as the clutch is disengaged a clutch brake stops it from rotating. This will tend to produce silence in the changing of gears. The clutch is held to its work by means of a heavy spring which is released through the action of a yoke which in turn acts on a ball thrust ring. A universal joint is provided between the clutch and the gearset so as to provide for any disalignment due to inequalities in the road or other causes. The universal joint and thrust bearing are both enclosed and packed tightly in grease to keep them well lubricated.

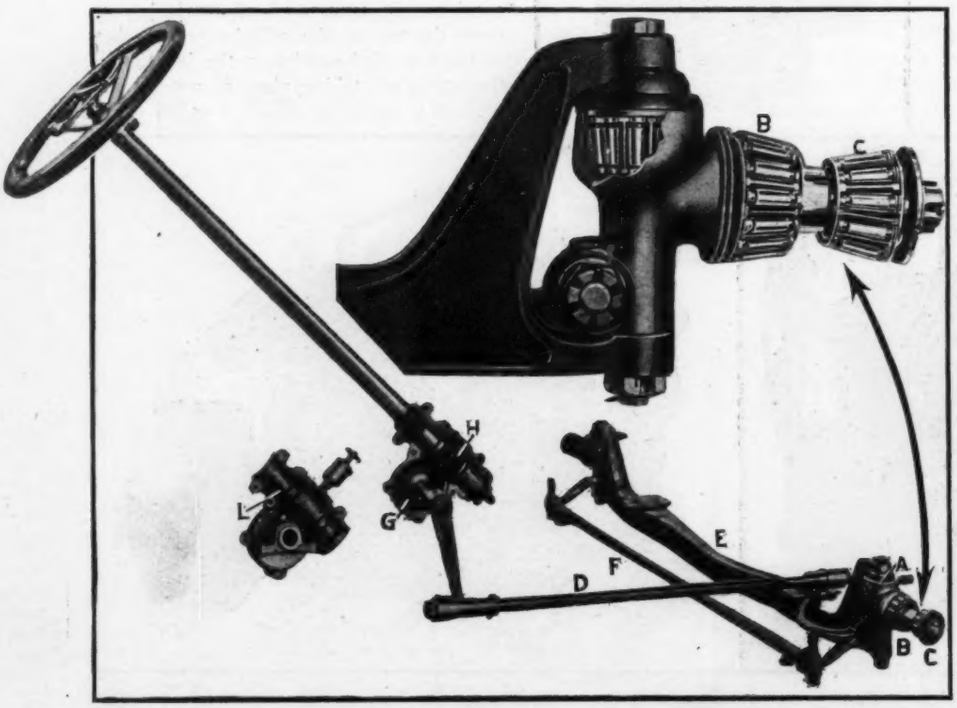


Fig. 11—View of front axle and steering gear with an enlargement of the knuckle

The gearset is mounted on a subframe in the center of the chassis and is accessible for adjustment or lubrication by means of a removable cover which can be detached by removing the floor board above it. One of the changes incorporated in the new models is in the gearset, as the size of the gears has been increased and the shafts have been made heavier. The shafts are of nickel steel heat treated, while the gears are of vanadium. The shafts are mounted on annular bearings which are capable of considerable wear before a change in adjustment is necessary. The change gear arrangement provides for three forward and one reverse speeds, the changes being made by means of a hand lever in the usual H-slotted quadrant. By this method the selective type of gearing is used; that is, any desired change may be made without passing through the other speeds. The gearset shafting runs in oil and is closed by means of stuffing boxes which prevent a leakage of the lubricant.

The propeller shaft is provided with universal joints at either end which take up the differences in alignment. The shaft is forged directly with the cross-pieces of the universal joints so that the

whole integral piece can be given the same degree of heat treatment. An object in the design of the chassis that is worth mention is that when the car is carrying passengers the springs will be deflected to just such a degree that the drive will be very nearly a straight line. This will save a loss in the driving efficiency. The universal joints on the propeller shaft are enclosed in grease-tight casings which protect them very effectively against any accidential derangement.

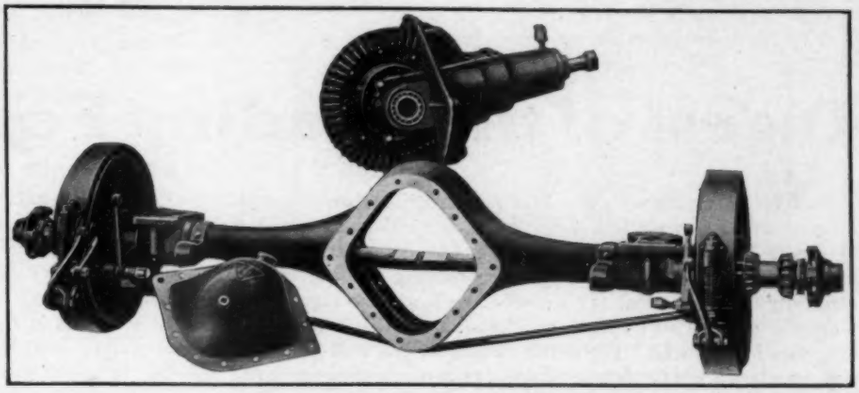


Fig. 12—Rear axle with differential removed. Note squared ends of live axles

The rear axle is of the floating type, the casing containing the differential and live axle being all in one piece, with an inspection cover bolted over the differential. The differential, large and small bevel gears and their bearings may be lifted directly out of the axle housing if it is desired without disturbing any adjustments. All moving parts of the differential and rear axle run on Timken roller bearings. Strut rods are fitted on the axle and are fastened to the frame by ball joints to relieve the frame of driving shocks, while the torque strains are taken up by a torque rod which is suspended between the spring buffers.

The front axle is a drop forging of I-section, the spring seats being forged integrally with the rest of the axle. The front axle E and steering gear are shown in Fig. 11. The steering pivot works on a Timken roller bearing A, which is made large enough to carry the weight of the car. This bearing is shown enlarged in the illustration, as are also the two wheel bearings B and C. The connecting rod F between the two wheels is placed behind the rear axle and the reach rod D which connects the front wheels to the steering gear is placed above the axle.

The steering is effected by an irreversible worm and gear G of vanadium steel which is enclosed in a tubular casing L. Jars and strains are removed from the steering gear by cushion springs which are fitted in the reach rod. The steering wheel is 18 inches in diameter, being of Circassian walnut with an aluminum center. The spark and throttle levers are mounted above the wheel.

Motor and transmission are supported by a subframe which is hot riveted to the main frame and stiffened by means of gusset plates. The springs are semi-elliptic front and rear, being 2 1-4 inches wide and 40 inches long in front and 56 inches in rear.

The wheels are of the artillery type and fitted with Firestone Q. D. rims, except that in the Model H roadster Goodyear rims are substituted. All five-passenger models are fitted with 36 x 4-inch tires, while the seven-passenger models have 36 x 4 1-2-inch tires. The rear wheels are equipped with foot and hand brakes, as shown in Fig. 10. The service or foot brakes and the hand emergency brakes are each furnished with equalizers and are of the expanding and contracting types.

The bodies provided with the standard chassis, are of twelve types and consist of a semi-racer roadster, an open-pony tonneau, five-passenger touring car, close-coupled five-passenger car, four-passenger torpedo, four-passenger semi-racer, three-passenger duck boat, fore-door five-passenger touring car, seven-passenger touring car, seven-passenger limousine and a four-passenger cruiser.

Fig. 13—Showing method of control in fore-door bodies

Fig. 14—Interior of the Speedwell Limousine body

Digest of the Leading Foreign Papers

Defects in Casehardening Work are attributable either to the process of cementation or to that of hardening. Those due to errors in the cementation may be (1) deformations, (2) failure to cement, (3) cementing where none is wanted, (4) irregularity of penetration, (5) excess of carbon percentage in the cemented shell, which causes accidents in the hardening, and (6) spots in the metal. The defects which the hardening process may produce are (1) deformations, (2) irregularities in hardness, (3) cracks and (4) spots.

Defects which may be due to other causes or which are not developed until the casehardening piece is taken into use are (1) partial or complete lack of hardness, (2) brittleness of the core, (3) brittleness of the shell (the same breaking off), (4) rupture of the shell and (5) deformations which are developed during use.

Deformations in cementing may be due to placing the piece in its box in such a position that its own weight will bend it when hot. More frequently it is due to twisted grain or fibre of the metal (*écrouissage*). The piece is usually made from rolled or drawn stock or it has been pressed or stamped and its molecular structure is more or less upset or misshapen. To avoid this trouble the stock, before it is machined, should be brought to a uniform heat 50 degrees higher than the critical temperature (which is about 900 degrees centigrade for soft casehardening stock), and should be allowed to cool slowly, especially if the steel is rich in nickel (5 per cent. to 6 per cent.), as otherwise martensite is likely to form, rendering the stock hard to work. At all events the hardening department should not accept deformed pieces, since it is relatively easy to redress pieces which have only been cemented. After all, however, a deformation which has been removed may reappear in the heat before quenching.

Failure to cement is rare and always due to poor workmanship. As has been proved, all steels except gamma steels (of high nickel and manganese) harden by cementation followed by bath.

Both failure to cement and failure to protect certain portions against cementation are discovered only after the quenching, by filing (or the scleroscope).

Irregularities in penetration come from poor distribution and packing of the cementation powder or compound, or from lack of uniformity in the fire. Irregularity in the carbon content of an otherwise equable shell is due to too high or too low heat, to wrong timing of the heat or to a poor cementation compound; rarely to an excess of silicon in the steel.

Too high carbon content in the outer shell is much to be feared. A cement too active, excessive temperature or prolonged exposure to the heat are the causes, and steels of medium carbon are more subject to this trouble than mild steels.

Spots in the metal are usually due to a silicious filler-earth or to a wet cementing compound.

No sure remedy has been devised against deformations resulting from the quenching, though Breshaw has shown that in the case of certain high-carbon steels a double heating reduces the deformation. Irregularity in the hardness, whether it is shown in each piece or by comparison among several pieces which should be of the same hardness, may be due to faults in cementation or to quenching at a wrong temperature (750 degrees C. is right), but it may also be due to loss of carbon in the heating before the bath, and the latter is the more frequent cause. If the atmosphere is oxidizing, which is the rule in furnaces heated by direct coal fire and common in gas furnaces, though perhaps only caused by the repeated opening of the furnace door, a decarbonization takes place which easily penetrates 1-10 mm. to 1-5 mm. into the shell and is sufficient to reduce the hardness of the finished piece greatly. Cracks in casehardened pieces are seldom due to the treatment, but usually may be traced to flaws in the billets. Spots appearing after the quenching are due to exposure to oxidation.—From treatise on casehardening by Léon Guillet in *Le Génie Civil*, July 29 and August 5.

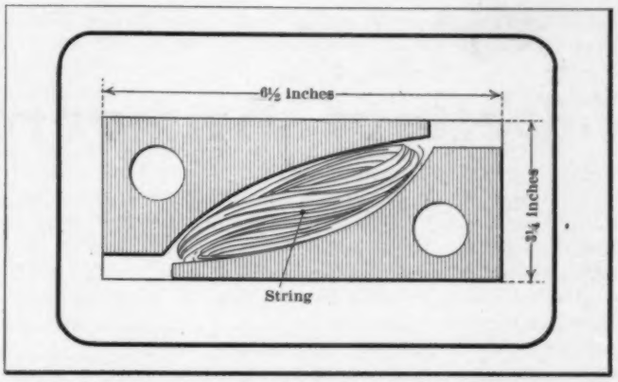
Laboratory and shop inspection of case-hardening work should be distinct and separate. Only the largest establishments can have a laboratory personnel whose function it is to supervise the reception of raw material or to check off materials at the steel works and afterwards verify the partial shipments. Where there is a laboratory force, it should take a certain number of samples from a lot of casehardened pieces and should try them by chemical analysis, especially for carbon content in the shell, and this content should not exceed 1.2 per cent. Further, a micrographic examination should show martensite at the center of the hardened piece, and even finely divided pearlite if the piece has been subjected to the double quenching process, but martensite and ferrite if it has been quenched at 750 degrees only. In large pieces some osmondite should appear. The shell should always be formed of very fine martensite without cementite. Examination of an annealed piece also gives valuable information, showing the thickness and regularity of the cemented layer and the carbon content at the surface, but it must be remembered that, during this annealing, carbon migrates from the periphery toward the center, lowering the carbon content at the surface.

The laboratory force should also look into the matter of possible brittleness of the core. In the majority of shops results are judged by filing with regard to hardness and from the grain of a fracture with regard to brittleness. But these tests are rudimentary and cannot be connected in figures. The grain gives occasion for most erroneous inferences. The result depends mostly upon the method used for producing the fracture and upon the thickness of the piece. As the author has shown (and illustrations are presented of the fractured pieces), the same casehardened bar fractured in several places a few centimeters apart shows a fine grain and a fibrous core wherever it has been broken by many light blows, but a very coarse grain where it has been broken by one severe blow. No importance should be attached to coarseness of grain, unless fractures are produced in a perfectly constant and predetermined fashion and unless it is very well known what kind of fracture each kind of piece should produce under these circumstances. In reality there is only one method for testing brittleness, which is by the notched bar and impact test, as prescribed in the main features by the congress of Copenhagen (1910), and the details of this method are in need of further precisioning. (The author here seems to take distance from those scientists who hold that the relations between tensile strength and the resistance to crushing. in test pieces of prescribed dimensions, always give an exact measure of brittleness).

The methods of shop inspection and control are of wider application and, therefore, perhaps of greater importance than those to be practiced at the laboratory. (1) All pieces arriving at the shop for treatment should be tried for hardness with reference to its uniformity. To this end the Brinell rating should be determined by a steel ball pressure apparatus which should be suitable for receiving pieces of greatly varying size and shape. One of the new Cail apparatus serves the purpose, or else another model which is used at the Derihon factories at Loucin-les-Liège and which the author has reproduced at the Dion-Bouton factories. It consists in a lever carrying the steel ball at one point and a weight at the end of the lever. All

pieces intended for treatment should, in the author's opinion, be passed under this apparatus, and one workman can perform this at a shop turning out 250 to 300 casehardened pieces per day. (2) The shop inspection of the cementation process is best served by placing a test piece of the same steel which is used for the work at some certain point of each box—preferably at the middle of it—and breaking this piece after quenching it at 750 degrees. After some experience this will give an approximate idea of the thickness of the shell in other pieces. (3) Shop inspection of hardness after quenching. Until recently it has not been possible to measure hardness. By filing it was only estimated, and the Martens sclerometer is only a laboratory instrument. In practice the scleroscope is now of the greatest utility in casehardening shops, as Portevin and Berjot have shown in *Revue de Métallurgie* for January, 1910. The height to which a steel ball, or rather a little hammer with a diamond point, rebounds from the hardened piece when allowed to drop from the top of scleroscope furnishes a practical means for actually measuring hardness in all its degrees, even if the rebound is to some extent a function of the mass of the test piece.

In brief, shop inspection of casehardening work involves the purchase of one Birnell apparatus and one scleroscope, which is not a highly expensive equipment, while the results are of the highest interest for securing the uniformity of work.—From treatise on casehardening by Léon Guillet in *Le Génie Civil*, July 29 and August 5.



Handy tool-box adjunct—chocks to block the wheels, and how to carry them

A USEFUL ADDITION TO THE AUTOMOBILIST'S TOOL-BOX—It is sometimes difficult to find a couple of stones of suitable size to chock under the wheels, when a car is left standing at the side of a steep road, and the brake adjustment is not always right for locking the wheels when the driver's foot or hand is not on the pedal or lever. With this difficulty in mind a motorist tells of an arrangement he has made. He has in his tool box two chocks or wedges made of pine wood and packed as shown in the illustration, a large skein of tarred string or cord acting as wedge to press the chocks against the sides of a little kit in which they are kept, thus preventing all rattling. And the string comes very handy for bandaging a sick tire or for wrapping any kind of a package. The two holes in the chocks make it easier to take the contents out of the kit, and also may serve as receptacles for two little rolls of adhesive tape.—*Automobile-Aviation*, September 14.

OKNOF, of the metallurgical laboratory at the Polytechnical Institute of St. Petersburg, details a series of experiments, accompanied with large micrographic plates, in which he comes to the result, among others, that, 1, pearlite consists of curved lamellæ of cementite imbedded in the mass of ferrite, and, 2, martensite consists of straight, flat, but not needleshaped, crystals.—*Métallurgie* (Halle a. d. Saale), Sept. 8.

Harking Back a Decade

TEN years ago this week *The Motor Review* contained notice of the following happenings:

A 9-horsepower Gasmobile, driven by William Walters and carrying Eddie Bald and Sam Brock, broke the record for the run between Buffalo and Niagara Falls by 2 minutes. The car made the distance in 38 minutes, some of the miles being turned in 1:30.

W. C. Janes has purchased the Buffalo branch of the Locomobile.

The capital stock of the newly formed Stearns Automobile Company has been offered to the public at Syracuse, N. Y. The common issue was offered at $5.25 a share, par value $25.

The automobile trade of Philadelphia has formed a permanent organization. The first act of the association was to postpone the show dates until early in 1902.

At Pittsburgh, for the first time, automobiles formed a feature of the industrial displays at the annual exposition.

Floor plans of the Chicago Coliseum, arranged for the show next March, indicate that the demonstrating track around the exhibits will be used again. This feature has been dropped from the New York shows.

Rumors are again in circulation of a merger of the tire-making interests at Akron. August Belmont and Charles R. Flint, who were active in forming the United States Steel Corporation, are said to be engineering the plan.

If some of the many thousands of good mechanics who are struggling to manufacture complete cars would turn their attention to the operation of storage and repair stations the automobile field would be cleared of many so-called manufacturers who are really only experimenters.—Editorial.

Three out of twenty cars that started in the Chicago-Buffalo tour reached the goal. The difficulty in touring is not to make the cars go over the road, but to make them go together. Pleasure on the move is hard to gain for a number of people collectively. The fact that only three cars finished is a reflection neither upon the cars nor the drivers.—Editorial.

A pneumatic self-starter for automobiles is the leading patent treated this week. Auxiliary valve gearing to supply compressed air is the feature. After starting it is necessary to shift the valve gear to supply the gasoline mixture. Patent No. 683,459.

The Shelby Steel Tube Company, of Greenville, O., announces that it will enlarge its plant materially. It is the intention of the company to become the largest seamless, cold-drawn tube plant in the country. A billet-piercing plant is to be installed by the company.

Pittsburgh police have taken a sharp interest in the speed limit recently. The legal rate is 12 miles an hour. Last Tuesday a well-known chauffeur was halted by an officer but he proved such a convincing talker that he was soon allowed to steam away.

The Stearns Steam Carriage Company will send seven types of carriages to be exhibited at the Boston show this Fall. The cars are all of 1902 model.

Six Locomobiles will act in place of horses as conveyances for the Grand Marshal and his aides at the forthcoming bi-centennial parade at Yale.

The race meeting of the Rhode Island Automobile Club will be held at Providence, October 17, 1901, and there are a large number of entries in the various events.

Letters Answered and Discussed

Concerning Engine Design

Editor THE AUTOMOBILE:

[2,862]—I would greatly appreciate it if you would give some information regarding gasoline engine design.

1. What should be the length of the piston used in connection with an engine having a bore of 4 inches?

2. What should be the diameter of the piston pin and what is the best location for it? How should it be fastened to prevent endwise movement?

3. How is the side-thrust on the cylinder walls calculated?

New York City. ADOLPH KLINE.

Referring to the sketch, Fig. 1, the dimensions of the various parts of the piston will be seen. The bearing surface of the piston for an engine of 4-inch bore should be about 4 1-8 inches in length. The wrist-pin may be located very nearly at the center of the piston or it may be located at the exact center and should be fastened by a set bolt and lock nut as shown. The set bolt may be a 3-8-inch bolt. The position of the piston rings is arbitrary to a great extent and the dimensions as given in the illustration need not be rigidly adhered to.

The side thrust on the cylinder walls is calculated by taking the thrust on the top of the piston and multiplying it by the tangent of the angle which the connecting rod makes with the axis of the cylinder. Since the tangent of this angle is a maximum when the crank makes an angle of 90 degrees with the cylinder axis the side thrust will be about a maximum at this point. Since the tangent of the angle used in the calculation is, at this point, the length of crank divided by the connecting rod, the calculation is simply one of multiplying the thrust upon the top of the piston by this fraction. At this point the thrust will not exceed 300 pounds which may be taken for a safe calculation. Taking an example to make the process perfectly clear, a connecting rod 12 inches in length may be assumed, and the crank which will equal one-half the stroke may be taken as 2 1-2 inches. The side thrust will then equal $\frac{300 \times 2\ 1\text{-}2}{12} = 62\ 1\text{-}2$ pounds. The explosion pressure is all that has to be reckoned with in designing the combustion space.

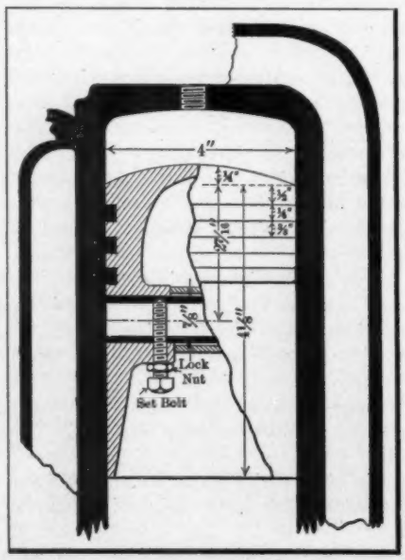


Fig. 1—Showing a section through a piston for a motor of 4 inches bore

The Editor invites subscribers to communicate their automobile troubles and personal experiences, stating them clearly on one side of the paper. If the nature of the case permits, send a sketch, even if it be rough, in order to assist to a clearer understanding. Each communication will receive attention in the order of its receipt, if the writer's signature and address accompany it as an evidence of good faith. If the writer objects to the publication of his name, he may add a nom de plume.

My Best Repair

Temporary automobile repairs made by the driver or owner while on the road and permanent repairs made in the garage after the run is over, are interesting to all automobile owners.

Every driver at one time or another gets up against it. Something breaks or gets out of order on the road—a stop has to be made and some repair effected.

It may be a spring leaf has broken; a shackle bolt or strap may break; a steering tie rod is bent; the car skids into a curb and bends a steering arm or the starting crank; a throttle or magneto connection breaks owing to vibration; a radiator leak is started by a stone or some other means; a leak in the gasoline tank is discovered; there is a small hole in the gasoline feed line; a brake facing may burn out; a brake connection breaks; a front axle gets slightly sprung; a clutch starts slipping, or any one of a thousand things may happen.

Every automobile owner is interested in knowing how repairs have been made, how long it took to make them, how much they cost, and by whom they were made. All this information broadens the knowledge of the automobile owner and so helps the industry.

Thousands of car owners who are readers of THE AUTOMOBILE, have had experiences of this nature and have made a temporary roadside repair—a permanent cure at the garage. We want you to write in simple language in a letter what repair of this nature you have had to make, how you made it, how long it took you and how much it cost.

You can make with your lead pencil one or two rough sketches indicating the broken or damaged part and showing how the repair was made.

We are going to publish these repair letters from week to week in these columns. Every reader should send in one experience or repair and how accomplished.

Some have experiences with short circuits, adjusting carbureters, motor knocks, hard starting, noisy timing gears, etc. Information on how these were discovered or rectified are equally interesting.

The experience of each reader is interesting to every other reader. To you, some of your repairs or experiences may be commonplace, but to owners of automobiles with less experience they are most interesting.

Analyze your past experiences and send in one or two of them.

Give your name and address, legibly written. If you do not want your name to appear, make use of a nom de plume.

Editor THE AUTOMOBILE.

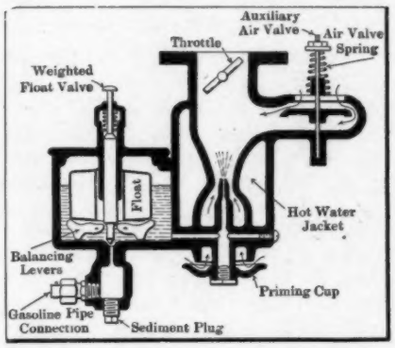


Fig. 2—Section through carbureter with eccentric float

Wants Points of Adjustment

Editor THE AUTOMOBILE:

[2,863]—I followed with great interest your directions as to the manner of adjusting the carbureter. I wish you would point out the positions of the various fixtures for adjusting the gasoline, air, etc., on different types of carbureters.

Plattsburgh, N. Y. AMATEUR.

The adjusting devices on all the carbureters are on the same principle and by the illustration of two of the common types it would be a simple matter to perform the adjustments on any and to locate the points of adjustment. Fig. 2 shows a type of carbureter in which the float is not concentric with the spray nozzle, while Fig. 3 shows a carbureter with the spray nozzle and float concentric. In the latter illustration the needle valve is adjusted at A, the auxiliary air valve at C, by either increasing or decreasing the tension on the spring B. The gasoline inlet is regulated at D, the main air valve at E and the drain cock is located

at F. By a comparison with the type depicted in Fig. 2 it is seen that the principles of adjustment are the same.

One Cylinder Dead

Editor THE AUTOMOBILE:

[2,864]—Since you have a page of your magazine devoted to the troubles of your subscribers I am going to take advantage of that fact and ask you to help me out of my trouble.

I have a car which is equipped with a four-cylinder motor. In one of the four cylinders I can get no explosion, and after having run the engine for a time the cylinder which does not fire contains quite an amount of oil. The electrical plant seems to be all right, including battery, wiring, magneto and spark plugs.

I have to prime the motor before it will start and, after priming it have to turn it over several times before getting an explosion. On the first explosion the engine will backfire and then will run all right except that the one cylinder will be dead.

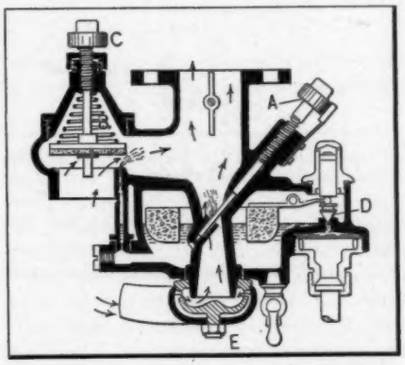


Fig. 3—Section through carbureter with concentric float

Would you kindly let me know what could be the matter?

M. W. VAN AMBER.

Castorland, N. Y.

Since the other cylinders fire without trouble after the engine is started the trouble will be of such a nature that it is confined to the one cylinder. This eliminates carbureter and magneto adjustments. The only parts of the ignition system which could affect but one cylinder are the spark plugs and the timer; the spark plugs may be eliminated by taking a plug out of one of the cylinders that does fire and trying it in the dead cylinder. The timer may form a perfect connection with all but the point which corresponds to the defective cylinder. Examine the contact points to determine if they are clean or whether the rotor shaft is eccentric and hence misses one of the points altogether. This will eliminate the ignition system.

The search should then turn to the valves. Try the compression of the defective cylinder and notice whether it is leaky. If so, the trouble will be found to be in a pitted, cracked or very dirty valve. If dirt lodges beneath the exhaust valve it will prevent its closing. If the compression is leaky and the valves are in perfect condition the fault lies in a cracked cylinder or in some other cause of leakage between the cylinder wall and jacket. A new cylinder will be required in this case or perhaps the damage may be repaired by some welding process.

The backfiring in starting the motor is due very likely to the fact that when you prime the motor you give it too much gasoline, unless the compression is leaky in these cylinders too which might be the primary cause of the trouble. It is very natural that the dead cylinder would accumulate a quantity of lubricating oil after the motor has been run for a length of time, as it will work its way up from the crankcase.

Wants More Power

Editor THE AUTOMOBILE:

[2,865]—I have a car which I have changed from a touring car to a runabout, the engine having a bore of 3 inches and a stroke of 5 1-2 inches. The exhaust valves are on the left-hand side of the motor and the inlet valves are overhead. The driving gear ratio is 2 2-3 to 1 with 36-inch wheels. Can you suggest a way to get more speed out of the engine?

If I advance my valve timing do I have to have different shaped cams? I am told that I would have to get cams made which would hold the valves open longer. The engine has all the power I need but will not turn over more than 1,300 revolutions per minute. D. B. BLAISDELL.

New York City.

The timing diagram illustrated in these columns in the issue of July 20 will give a valve timing which should give the engine a maximum flexibility. If the cams fitted now are not of correct shape to hold the valves open for the period required they will have to be changed for new ones. The exhaust valves are held open for 225 degrees of the crank circle while the inlet valves are held open during a period of 200 degrees.

At 1,300 revolutions per minute the maximum speed attainable with the gear ratio specified would be 52 miles an hour which should be improved by a better timing of the valves.

Has Carbureter Troubles

Editor THE AUTOMOBILE:

[2,866]—After going through a period of tinkering and experimenting on my carbureter I at last conceived the idea of appealing to THE AUTOMOBILE for advice. I intend buying a good carbureter and before purchasing wish to become acquainted with the following points:

1. What are the requirements of an ideal carbureter?

2. Is there a carbureter which offers but a negligible resistance to the ingoing air no matter whether the engine is going fast or slow?

3. Does the increased resistance of the air decrease the power of the engine? I find that if the carbureter is regulated for high speed it is not adjusted correctly for low speed. WM. POLACHECK.

Milwaukee, Wis.

1. The ideal carbureter would furnish a perfect mixture in all senses of the word at all engine speeds and under all conditions of atmospheric humidity.

2. The resistance offered to the incoming air by the carbureter passages is negligible in any of the modern carbureters.

3. The horsepower expended in drawing the air into the mixing chamber is so small that it is not worth attention in figuring the efficiency of the motor.

Has Leaky Tire

Editor THE AUTOMOBILE:

[2,867]—I have a slow puncture in the inner tube and I cannot locate it by listening for a leak, and I would like to know how it is possible to determine the leads in inner tubes when they are so small as to be invisible.

If the tire is porous will it hold the air for a time and then allow it to leak out of the inner tube or will there be a continuous leak? CHAS. CAMMON.

Burlington, Vt.

The tires are easily tested by placing them when inflated in a deep pan of water such as is shown in Fig. 4. It is a very good plan to hang the tire above the pan as shown and to slowly turn it about. The presence of bubbles will indicate a leak. If the entire surface of the tire is covered with bubbles it will indicate a porous condition of the tire. When a tire is porous the leak will be continuous, the tire not being able to hold the air it contains for any time.

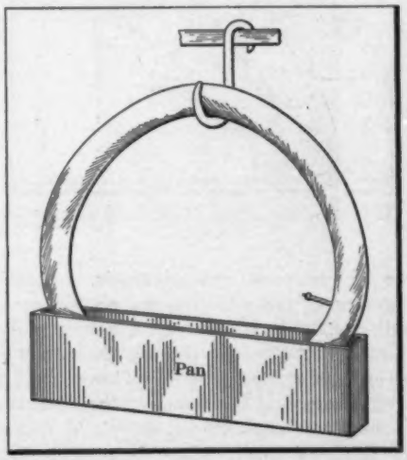


Fig. 4—Method of supporting tire when testing for leaks

Little Bits of Motor Wisdom

Pertinent Pointers for Repairman and Driver

SPRINGS MUST BE CAREFULLY FASTENED—A chassis spring can attain the height of its usefulness and efficiency only when it is fastened in the proper manner. The object of springs is to increase the comfort of riding by arresting shocks which may be transmitted from the road to the body of the car through the chassis. Hence the springs are inserted between the body and the chassis in order to absorb these shocks. Shocks are caused by rapid changes of condition; that is, the rapid arresting of motion or the rapid starting of a stationary body. Hence if the car is started in a downward direction by falling into the small irregularities of the road, instead of being brought to rest with a jar, the shock will be absorbed to a large degree by the springs, which will bring the body of the car slowly to rest. When the wheels of the vehicle pass over an obstruction or sink into a hollow of the road, they alternately expand and compress the springs so that very little of the shock is felt by the passengers.

The three most common springs used in modern automobile body work are the elliptic, three-quarter-elliptic and the semi-elliptic. The first variety, the elliptic, have

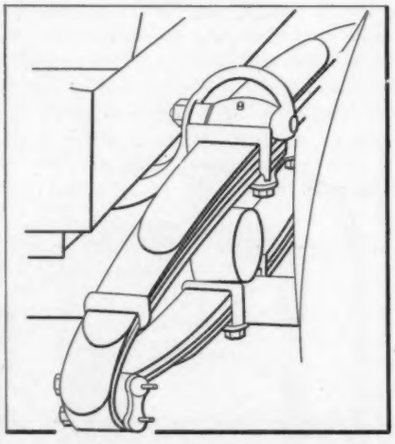


Fig. 1—Showing method of fastening scroll elliptic spring

the halves each a semi-elliptic, fastened together at the ends so that an ellipse is built up. The fastening is generally by means of bolts which pass through the spring ends; the upper and lower halves are connected at the center of their lengths to the frame and axle respectively by means of bolts or clips. These bolts and clips should be fastened in such a way that they do not interfere with the motion of the leaves of the spring, nor should they weaken the spring at the point of application.

The leaves of the springs, which are built up in the manner of those mentioned above, slide over one another as the spring is compressed or expanded. In the elliptic type the spring is elongated under the influence of a load; that is, the members of the spring become more nearly straight as the curvature is reduced. Since the curvature is reduced, each leaf of the spring attains a greater over-all length, and hence the ends of each leaf must slip over the leaf below. It is evident that the springs must not be fastened at any point which will interfere with this motion; therefore they can only be attached rigidly at the center of their length, since this point does not change relatively to the center of the length of any of the other leaves no matter how the spring is compressed or allowed to expand.

Some of the methods of making this fastening are depicted in Figs. 1, 2 and 3. In Fig. 1 a variation of the elliptic type of spring, known as the scroll elliptic, is shown. This spring consists of two members joined by shackles, the top half being a scroll and the lower half a semi-elliptic. The method of joining this spring to the axle and frame may be seen in this illustration. The fastening consists of two clips of inverted U shape, the ends of which pass through a flange of the frame beneath the spring. This is similar in many respects to the method illustrated in Fig. 2. In this case the inverted U clips are used as shown in Fig. 1, and besides this an additional clip is used between the two U clips, consisting of a plate with two bolts passing through it and also through the holding flange.

In Fig. 3 another method of fastening the spring is shown, a special bracket being employed, in this case consisting of two struts and a flange plate through which the bolts pass. The dotted lines indicate a plate which has been removed in order to show the supporting bracket.

The two other springs described, the semi-elliptic and the three-quarter elliptic, are, as suggested by their names, either a half-ellipse or a half-ellipse with a quarter-ellipse added. They are fastened in the same manner at the bottom as the elliptic, the difference being in the manner of supporting the top or frame joint. They are usually held by shackles which are supported by the frame, and in the case of the three-quarter elliptic springs the end of the quarter-ellipse rests upon a platform.

The principal point to observe in fastening the springs is that nothing is done to weaken the spring by piercing it with holes of a dangerous diameter or by cutting it in any way. It must be remembered that the greatest strain on the spring is at the point at which it supports the weight, in the great majority of cases, since this occurs at

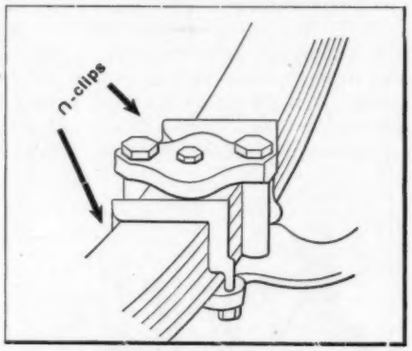


Fig. 2—Illustrating the inverted U-clips employed in holding spring

the center of the spring, and as the fastening is also at that point great care must be taken that too much material is not cut away in making the fixture.

ADJUSTING VALVE STEMS—As the valves are ground down the valve stems are gradually lowered. The lowering is very slight on each grinding of the valve, as very little material is taken off the surface of the valve at each grinding; but after the valve has been repeatedly reseated the lowering of the valve stem will be so great that it will be necessary to adjust it in order that the lift of the valves will be correct. The space between the valve push rods and stems should be about 1-32 inch and can be determined by inserting a feeler gauge, or if there is no feeler gauge available at the time a piece of cardboard about twice the thickness of the average business card may be employed.

The adjusting nuts are then turned so that the valve stem will have the proper clearance as determined by the gauge or doubled card. After the adjustment is made it should always be checked by determining if the valve remains closed during the period required. This is done by taking a piece of thin paper and inserting it beneath the stem of the valve and the engine turned slowly over through the part of the stroke in which the valve is supposed to remain closed. The paper is frequently

moved about during this process and if it is pinched at any time it is a sign that the adjustment is not correct, since the pinching of the paper indicates the point at which the valve starts to open. If the pinching takes place at the proper time for the opening of the valve the closing time should also be noted. This is done in just the opposite manner in which the opening time is determined. The paper is continually pinched by the valve stem until it is time for the valve to close, when the paper should be released. The flywheel is generally marked so that the timing as given by the card test can be checked by this. If it is not marked the position of the crank handle will act as a guide in the matter or the position of the piston may be determined by removing a pet-cock or other fitting from

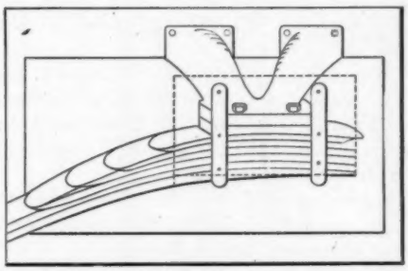


Fig. 3—Method of supporting spring by means of a flanged bracket

the top of the cylinder and inserting a stick which will be lifted by the piston on its travel. It is much better and handier, however, to have the flywheel marked for the opening and closing position of each valve as well as for the upper and lower dead centers of the motor.

The clearance allowed between the valve stem and push rod is very necessary and should not be overlooked in adjusting the valve-lifting mechanism, as the rod will materially expand after the engine has been running for a length of time and has become warmed up. The clearance should not be too great, however, as this would cause the valve to open later than was intended. In the case of the exhaust valve the exploded gases would not have time to be well cleared out of the cylinder, and what remained would dilute the fresh charge to such an extent that the power of the engine would be materially cut down. In the case of an inlet valve the opening of the valve would be delayed and the required weight of charge would not be drawn into the cylinder and the consequence would also be a loss of power.

LUBRICATING SPRINGS—Lubrication is another great factor in the well-being of the spring and is next to the fastening in importance. In absorbing the shocks of the road the different laminations of the spring slide upon each other and in order that they do so in as easy a manner as possible it is necessary that they be well lubricated. There are various means in use of keeping the springs properly greased, most of these consisting of a series of grooves and slots. The oil is generally applied by jacking up the frame of the motor, which will cause the various leaves of the spring to separate, since all the strain is taken off the spring; it is then very easy to cover the leaves with heavy cylinder oil.

The spring bolts and shackles are fitted, as a rule, with grease cups, which should be given a full turn about every 100 miles or once a day. This is a very important operation so far as the noiseless action of the car is concerned. The oil not only insures easy action of the springs but also acts as a rust preventive while the car is not in use.

DO NOT START ON SPARK—A practice which has been in vogue for some time is to open the throttle after the spark has been shut off when stopping the engine, and while it is still running under its own momentum to allow it to draw in a charge of gas in at least one of the cylinders. The spark is then switched on when the driver wishes to start the engine, and in the case of a six-cylinder motor, and very often in a four-cylinder, the piston will be in firing position in one of the cylinders and the motor will start. While this does away with the necessity of cranking the motor, it is not by any means beneficial to it, as the full shock of the explosion is taken up by the motionless parts and the consequent inertia is very great.

The effect of starting upon the spark is very much the same as if the head of the motor were hit a very severe blow with a heavy sledge, muffled in such a way that there is no metallic contact between the cylinder head and the sledge. The jar given to the motor is extremely heavy and is hence to be avoided. The life of a motor which has been continually started upon the spark will be decreased materially as compared with one which is always started by cranking.

KEEPING MAIN BEARINGS COOL—Within the crankcase of the automobile motor there is always present a mist of oil without regard to the system of oiling used. When the splash system of oiling is used this mist assumes the proportions of a spray and pervades the crankcase to such an extent that the actual running temperature of the lower part of the motor is reduced owing to its cooling influence.

The main bearings are often lubricated solely by the oil mist which works its way into the bearings; but this in some cases is not sufficient, a long bearing being apt to overheat. To prevent an occurrence of this nature the bearing casing is often recessed so as to form a sort of cup on the upper half. Holes are then drilled through the upper part of the bearing casing, so that there is a lead from the cup to the bearing through which the oil slowly seeps and distributes itself along the length of the bearing and drips out at the ends. The manner in which these ducts are often cut in the bearing casing is shown in Fig. 4, where the pockets are labeled and the holes from these are shown leading down to the bearing surface.

The main bearings are usually amply supplied where the force-feed system is used, as there is a lead from the pump directly to each of these bearings. The oil is often supplied in a case of this kind under considerable pressure, so that when a hollow crankshaft is employed to distribute the oil the centrifugal force due to the revolving crankshaft may be overcome in forcing the oil into the center of the shaft. The oil lead to the bearing registers with the opening into the crankshaft during a part of each revolution, and during this time the oil is forced into the crankshaft. During the remainder of the time the oil is forced into the bearing itself.

A very common means of lubricating the main bearings which has found considerable favor in recent years is to employ a combination force-feed and splash system. When this method is used there is a lead from the source of oil supply, whether it be from the sight feed or pump, to the main bearings. Thus far the system is the same as the force-feed type, but instead of leading the oil through a hollow crankshaft, or through independent leads to the cylinder walls and connecting rod bearings, the remainder of the lubrication outside of the main bearings is accomplished by the splash system. The oil is allowed to overflow from the main bearings into the splash compartments on either side of the main bearing bridges. Since the oil is supplied to the main bearings in this case very rapidly, the splash troughs are always kept

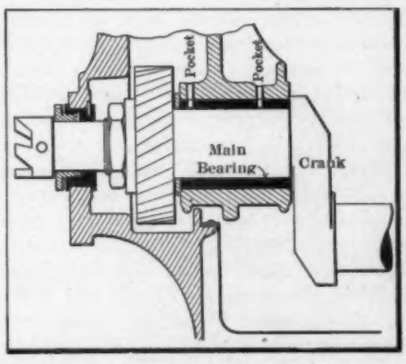


Fig. 4—Showing the oil ducts often cut through the main bearings

full and overflowing, and the main bearings very amply lubricated and adequately cooled. When this method of oiling is employed it should be made a point that the oil is allowed to flow to either end of the bearing so that there is an overflow in either direction. This can be done by having the oil lead directly in the center of the bearing and by suppling an adequate quantity of oil.

My 1912 Automobile

Some Conceptions of What the Ideal Car Should Be

A $5,000 Car

Editor THE AUTOMOBILE:

I would like to see an announcement along the following lines by some leading producer of high-grade cars: Motor, six-cylinder, Knight type; bore, 4 3-4; stroke, 6 inches; four speed selective transmission with direct drive on fourth.

Self-contained force feed and splash oiling systems.

I would specify a worm drive for the sake of silence and gas and spark control on top of steering wheel.

Double ignition should be installed and also a high-tension complete electric-lighting system, including dynamo.

Compressed air starting device, available for inflating tires, should be installed and also a carburetor air adjustment on steering column. The multiple disc clutch should run in oil.

The radiator and hood should be similar to Renault type, giving protection to radiator, better view of road, and (in my opinion) handsomer lines. I would specify an underslung frame for following reasons: 1st. A very large per cent of fatal accidents are caused by overturning. Any feature which lessens this danger seems to me important. 2d. Ease of entering car. 3d. Appearance.

The wheels should be of a size to give minimum road clearance of 11 inches. Steering column should have an extreme inclination (as in Lozier torpedo) for ease in steering, while the tires should be carried at rear, in an upright position.

Fore-door torpedo body, with comfortably high sides and backs and thick upholstery, is my choice, with overhanging cowl, carried well up and back toward steering wheel; seats 12 inches high from floor and a wheelbase of length to insure ample foot room for all occupants, especially in the front seats (say, 140 inches for six-passenger torpedo). Extra seats should be removable and a clamp for baggage should be on the running board. To insure beauty of outline the body lines should not exceed in height the top of the radiator and hood. Particular attention ought to be paid to all parts and adjustments, especially grease cups, the replenishing of which, on many cars, causes sinful language daily. A two-gallon reserve oil tank and a gas tank of 250 miles capacity, with drain cock for quick emptying of same, should be fitted. Rubber cushions between chassis and body to prevent squeaks should be a feature.

I would specify a full equipment, including speedometer, clock and windshield, with stay rods extending no farther in front than the dash. Top and demountable rims of course. The above figures are in no particular intended as exact. They merely express in a general way my ideal of a car and costing around $5,000. It is my impression that such a car would take with the class of buyers who want the best.

C. O. M.

Putnam, Conn.

Likes a Heavy Car

Editor THE AUTOMOBILE:

No two people have the same ideas of cars, and each one believes in his own selections, but I am sure that a great many people will agree with most of my selections. I shall not give specifications of body design or length, width and number of spring leaves, etc., but will confine myself to the following:

The motor should be of the (T) head type, five-inch bore and six-inch stroke, four cylinders cast in pairs, with three-bearing crankshaft and valves two and three-fourth inches in diameter.

Four-speed transmission with three to one on fourth would give plenty of speed when desired and also produce a very quiet and easy running engine at moderate speed. The large engine would give plenty of power on the hills and with this transmission would prove more economical than a smaller engine. The gearset should be carried amidships, bolted to the frame.

The ignition should be double. I mean by double two separate systems even down to the switches. This allows both systems to be used at once.

The carbureter should be a multiple jet with auxiliary air intake to be regulated by hand from under the steering-wheel. This would give a very strong and flexible carbureter.

Lubrication should be by splash from oil troughs, oil reservoir being in bottom of crankcase. Oil should be pumped through a sight feed on dash; after being used it should be strained and sent through again.

Clutch would be of the expanding band type with cork inserts and a screw adjustment. This clutch would be extremely easy to remove and to adjust.

Drive should be through a shaft, direct drive being on fourth speed.

Steering should be by irreversible worm and sector gear. This design is adjustable and does not allow any of the road shocks to be transmitted to the driver's arms.

The springs should be of the platform type in the rear and semi-elliptic in front which ought to make an easy riding car.

Wheelbase should be 120 inches and tires all round 36 x 4 1-2.

Front axles should be I-beam with full floating axles in the rear. Full floating axles allow all weight to be carried upon the axle housing and wheels, while the axle has only the driving strain to take care of.

The body should have plenty of leg room in both seats; eleven inch clearance is required. Special attention should be given to the depth of seats and a space in car for extra tires.

Control should be above the steering wheel, moving upward. Acceleerator outside of clutch and brake pedals.

The two brakes should both work on the wheel drums, foot brake contracting, with emergency expanding.

This car could be built and marketed for $2,500 and should not weigh more than 3,400 pounds. Most people want light weight cars on account of the tire cost, but they must be careful not to rob the easy riding qualities of the car by making it light, besides the strength of each part necessarily comes before the question of weight.

W. J. MARLIN.

Du Bois, Pa.

Wants the Car Well Made

Editor THE AUTOMOBILE:

There is an old saying that we want but little here below, but in my ideal car I might add that we want that little good. A motor with about 4-inch bore and 4 3-4-inch stroke capable of attaining 2,500 revolutions per minute, cone clutch, three speed selective transmission and worm drive would be the main characteristics. The magneto should be of the double-distributor type and the chassis should not weigh more than 1,600 pounds.

Price cutting in automobile manufacture must entail some cut either in material or workmanship and it is my firm belief that if a car were made of the best and the makers satisfied with a reasonable margin of profit there would be room for such a concern in the automobile business. The time will come when a car will sell on its merits rather than the fact that it is a few dollars cheaper than that made by some other competitor.

M. P. H.

New York.

My Best Repair

A Chapter of Accidents

I WAS once confronted by what seemed to be a breakdown that would necessitate the car being towed into the nearest town or taking the gasoline tank off the car and taking it to some repair shop.

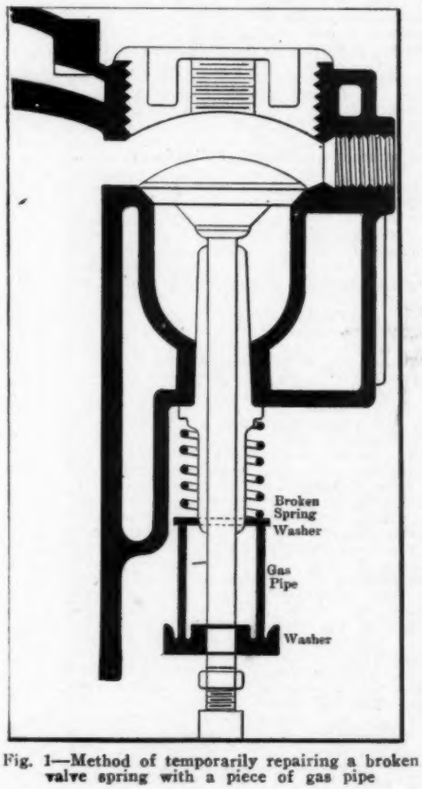


Fig. 1—Method of temporarily repairing a broken valve spring with a piece of gas pipe

Briefly what happened was as follows: I was driving a car over some very bumpy roads and the pipe inside the gasoline tank became unsoldered. The pipe carried the gasoline from the bottom of the tank under pressure so that when it broke it was impossible to feed the carbureter from the tank. The tank contained about 18 gallons of gasoline and at first I thought that there was a leak in the pressure circuit, but upon removing the cover of the float chamber I found that the pressure passed clean through the gasoline line. The filler of the tank was rather small; too small, in fact, to allow of putting the hand inside. Just at that moment a small boy was passing and with the aid of a few cents I prevailed upon him to put his hand inside and feel around to see if the pipe was broken or not. He was able to reach it, but as it lay at the bottom of the tank and there were baffle plates it was not possible to remove it.

The thought occurred to me to use a spare can of gasoline and syphon it out, but as I did not have a can on board I had to walk some distance to a house to procure one. Then came the question of syphoning the gasoline from the main tank to the improvised one and from the latter to the carbureter. The rubber connection of the tire pump served for the first operation all right, but was not long enough for the second. I took the copper pipe from the acetylene system and attached a piece of rubber tubing at each end, inserting one end in the emergency tank, which I placed in my companion's arms, as shown in Fig. 2.

A triangular file served as a hack-saw to cut the gasoline pipe about 10 inches from the carbureter. The only way to start the syphon working was to suck on it with my mouth and quickly connecting up the rubber tube to the feed pipe. The contraption lasted for about one hour, just sufficient to get me home, as the rubber was eaten away by the gasoline passing through it.

I learned, however, that using a flame on the gasoline tank was a very delicate operation even after leaving it for several hours with the filler and drain plugs removed. To make sure I pumped air with a tire pump through the tank for fully half an hour, but as soon as a flame was applied to remove the solder around the joint a terrific explosion took place and a fantail flame exuded from the filler, lapping the right side of my face. There happened to be a gear box that had been opened up, and I plunged my hand into it and smeared my face with the lubricant, which prevented the burn from taking much more effect than singeing my hair and causing the skin to peel.

New York. H. M.

Broken Valve Spring Repair

Being away on a tour and trusting to others to see that the car was in good shape before starting I had the misfortune to break a valve spring. Such a thing had never happened to me before, and I had neglected to carry a spare spring. I believe in always carrying a good piece of copper wire, a pair of pliers, adjustable wrench and hacksaw. With these three a repair can be made, as was proven in the present instance. The jack handle of my car was tubular, in fact, similar to a piece of gas pipe, so I cut off a sufficient length so as to insert it between the valve washer and a washer I happened to have on the car. By "happened" I mean I looked around the car till I came to one of the brake connections that had washers fitted and I removed it. The sketch shown in Fig. 1 illustrates the repair as executed.

Philadelphia. T. W. Wolf.

Burnt-Out Bearing—Got Home

I cannot remember ever having been called upon to exert any gray matter on the road in extricating myself from an embarrassing situation.

I remember once, however, that my engine began to pound in the front cylinder and upon removing the inspection cover I found that the bearing, which was of white metal, had started to run. Upon removing the connecting rod and piston from the cylinder I ran home on "three," averaging about 10 miles per hour.

Hartford. Burnt Out.

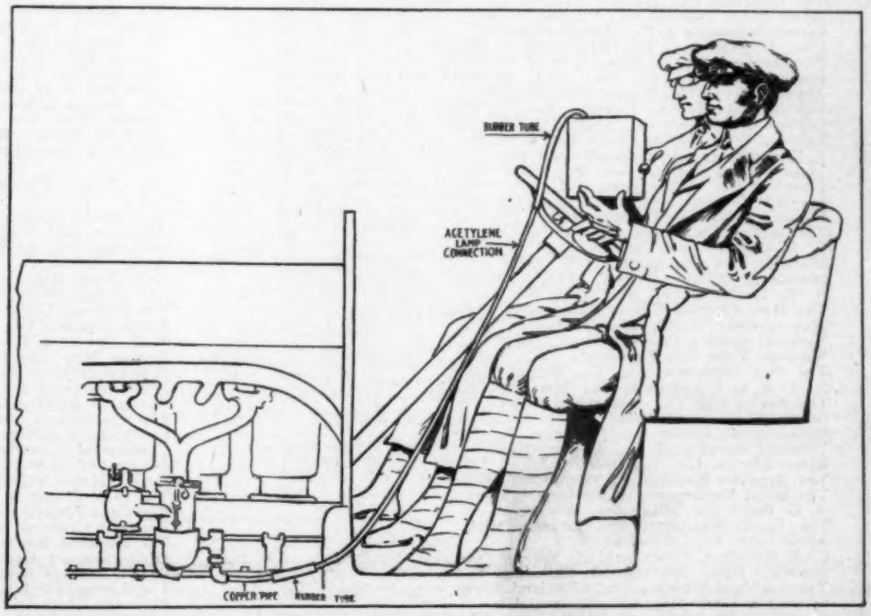


Fig. 2—Getting home with a defective gasoline tank by using the acetylene connections

M. & A. M. Allots Show Spaces

COMPLETE allotments of space for the shows in Madison Square Garden, New York; Coliseum and Armory, Chicago, and Mechanics' Hall, Boston, have been announced by the Motor and Accessory Manufacturers. The spaces for the exhibition in the New Grand Central Palace have not yet been assigned. Below is a list of the accessories exhibitors at the three shows mentioned:

Madison Square Garden for Both Weeks.

Ajax-Grieb Rubber Co., New York, N. Y.
American Ball-Bearing Co., Cleveland, Ohio.
American Circular Loom Co., Aldene, N. J.
Apple Electric Co., Dayton, Ohio.
The Badger Brass Mfg. Co., Kenosha, Wis.
The Baldwin Chain & Mfg. Co., Worcester, Mass.
Bosch Magneto Co., New York, N. Y.
S. F. Bowser & Co., Fort Wayne, Ind.
Briscoe Mfg. Co., Detroit, Mich.
Brown-Lipe Gear Co., Syracuse, N. Y.
Byrne, Kingston & Co., Kokomo, Ind.
Champion Ignition Co., Flint, Mich.
The Chandler Co., Springfield, Mass.
Chicago Telephone Supply Co., Elkhart, Ind.
Coes Wrench Co., Worcester, Mass.
Columbia Lubricants Co., New York, N. Y.
Columbia Nut & Bolt Co., Bridgeport, Conn.
The Connecticut Telephone & Electric Co., Meriden, Conn.
Consolidated Rubber Tire Co., New York, N. Y.
Continental Caoutchouc Co., New York, N. Y.
Covert Motor Vehicle Co., Lockport, N. Y.
The Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.
Crucible Steel Co., Pittsburgh, Pa.
The Dean Electric Co., Elyria, Ohio.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
The Diamond Rubber Co., Akron, Ohio.
Jos. Dixon Crucible Co., Jersey City, N. J.
Dorian Remountable Rim Co., New York, N. Y.
Driggs-Seabury Ordnance Corp., Sharon, Pa.
Edison Storage Battery Co., West Orange, N. J.
The Edmunds & Jones Mfg. Co., Detroit, Mich.
Eiseman Magneto Co, New York, N. Y.
The Electric Storage Battery Co., Philadelphia, Pa.
Empire Tire Co., Trenton, N. J.
Firestone Tire & Rubber Co., Akron, Ohio.
The Fisk Rubber Co., Chicopee Falls, Mass.
G. & J. Tire Co., Indianapolis, Ind.
Gemmer Mfg. Co., Detroit, Mich.
The B. F. Goodrich Co., Akron, Ohio.
The Goodyear Tire & Rubber Co., Akron, Ohio.
Gray & Davis, Amesbury, Mass.
The R. E. Hardy Co.,
A. W. Harris Oil Co., Providence, R. I.
Hartford Rubber Works Co., Hartford, Conn.
Hartford Suspension Co., Jersey City, N. J.
Havoline Oil Co., New York, N. Y.
Herz & Co., New York, N. Y.
The Hess-Bright Mfg. Co., Philadelphia, Pa.
The Hoffecker Co., Boston, Mass.
Hyatt Roller Bearing Co., Newark, N. J.
Janney-Steinmetz & Co., Philadelphia, Pa.
Isaac G. Johnson & Co., New York, N. Y.
Phineas Jones & Co., Newark, N. J.
Jones Speedometer Co., New York, N. Y.
Atwater Kent Mfg. Works, Philadelphia, Pa.
Kokomo Electric Co., Kokomo, Ind.
Leather Tire Goods Co., Niagara Falls, N. Y.
Lebanon Steel Casting Co., Lebanon, Pa.
J. Ellwood Lee Co., Conshohocken, Pa.
Light Mfg. & Foundry Co., Pottstown, Pa.
Link-Belt Co., Indianapolis, Ind.
Lovell-McConnell Mfg. Co., Newark, N. J.
McCord Mfg. Co., Detroit, Mich.
The McCue Co., Buffalo, N. Y.
C. A. Mezger, New York, N. Y.
Michelin Tire Co., Milltown, N. J.
Morgan & Wright, Detroit, Mich.
A. R. Mosler & Co., New York, N. Y.
The Motz Clincher Tire & Rubber Co., Akron, Ohio.
Muncie Gear Works, Muncie, Ind.
National Carbon Co., Cleveland, Ohio.
National Tube Co., Pittsburgh, Pa.
The New Departure Mfg. Co., Bristol, Conn.
N. Y. & N. J. Lubricant Co., New York, N. Y.
The Noera Mfg. Co., Waterbury, Conn.
Oliver Mfg. Co., Chicago, Ill.
Pennsylvania Rubber Co., Jeannette, Pa.
Pittsfield Spark Coil Co., Dalton, Mass.
Remy Electric Co., Anderson, Ind.
The Republic Rubber Co., Youngstown, Ohio.
The Royal Equipment Co., Bridgeport, Conn.
A. O. Smith Co., Milwaukee, Wis.
The Sparks-Withington Co., Jackson, Mich.
Spicer Mfg. Co., Plainfield, N. J.
C. F. Splitdorf, New York, N. Y.
Standard Roller Bearing Co., Philadelphia, Pa.
The Standard Welding Co., Cleveland, Ohio.
Stewart & Clark Mfg. Co., Chicago, Ill.
Stromberg Motor Devices Co., Chicago, Ill.
Swinehart Tire & Rubber Co., Akron, Ohio.
The Timken-Detroit Axle Co., Detroit, Mich.
The Timker Roller Bearing Co., Canton, Ohio.
The Turner Brass Works, Sycamore, Ill.
U. S. Light & Heating Co., New York, N. Y.
Vacuum Oil Co., New York, N. Y.
Vanadium Metals Co., Pittsburgh, Pa.
The Veeder Mfg. Co., Hartford, Conn.
Warner Gear Co., Muncie, Ind.
Warner Mfg. Co., Toledo, Ohio.
Weed Chain Tire Grip Co., New York, N. Y.
Weston-Mott Co., Flint, Mich.
Wheeler & Schebler, Indianapolis, Ind.
Whitney Mfg. Co., Hartford, Conn.
J. H. Williams Co., Brooklyn, N. Y.
O. W. Young, Newark, N. J.
Federal Rubber Mfg. Co., Cudahy, Wis.
Detroit Electric Appliance Co., Detroit, Mich.
Carnegie Steel Co., Pittsburgh, Pa.
Automobile Supply Mfg. Co., Brooklyn, N. Y.
The Simms Magneto Co., New York, N. Y.
International Acheson Graphite Co., Niagara Falls, N. Y.
The Buda Co., Harvey, Ill.
Stutz Auto Parts Co., Indianapolis, Ind.
Bower Roller Bearing Co., Detroit, Mich.
United Rim Co., Akron, Ohio.
Jacobson-Brandow Co., Pittsfield, Mass.
General Electric Co., Schenectady, N. Y.

Madison Square Garden for First Week Only

Allen Auto Specialty Co., New York, N. Y.
Auburn Auto Pump Co., Boston, Mass.
The A-Z Co., New York, N. Y.
Briggs & Stratton Co., Milwaukee, Wis.
Continental Rubber Works Co., Erie, Pa.
Adam Cooks' Sons, New York, N. Y.
C. Cowles & Co., New Haven, Conn.
Dover Stamping & Mfg. Co., Cambridge, Mass.
Gabriel Horn Mfg. Co., Cleveland, Ohio.
The Gilbert Mfg. Co., New Haven, Conn.
Globe Machine & Stamping Co., Cleveland, Ohio.
Gray-Hawley Mfg. Co., Detroit, Mich.
George A. Haws, New York, N. Y.
Hayes Mfg. Co., Detroit, Mich.
Heinze Electric Co., Lowell, Mass.
Hodgman Rubber Co., New York, N. Y.
Kellogg Mfg. Co., Rochester, N. Y.
National Coil Co., Lansing, Mich.
The Pantasote Co., New York, N. Y.
Rose Mfg. Co., Philadelphia, Pa.
J. H. Sager Co., Rochester, N. Y.
The Seamless Rubber Co., New Haven, Conn.
C. A. Shaler Co., Waupun, Wis.
The Sprague Umbrella Co., Norwalk, Ohio.
The Springfield Metal Body Co., Springfield, Mass.
The Stein Double Cushion Tire Co., Akron, Ohio.
Valentine & Co., New York, N. Y.
Vesta Accumulator Co., Chicago, Ill.
Warner Instrument Co., Beloit, Wis.
Western Tool & Forge Co., Brackenridge, Pa.
White & Bagley Co., Worcester, Mass.
The Willard Storage Battery Co., Cleveland, Ohio.
The Manufacturers Foundry Co., Waterbury, Conn.
Doehler Die-Casting Co., Brooklyn, N. Y.
The Hess Spring & Axle Co., Carthage, Ohio.
The G. Piel Co., New York, N. Y.
The Esterline Co., Lafayette, Ind.
Universal Wind Shield Co., Chicago, Ill.
The Batavia Rubber Co., Batavia, N. Y.
Double Fabric Tire Co., Auburn, Ind.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Wolverine Lubricants Co., New York, N. Y.

Chicago Show for Both Weeks

Ajax-Grieb Rubber Co., New York, N. Y.
American Ball Bearing Co., Cleveland, Ohio.
American Circular Loom Co., Aldene, N. J.
Apple Electric Co., Dayton, Ohio.
Auto Parts Mfg. Co., Muncie, Ind.
The Badger Brass Mfg. Co., Kenosha, Wis.
The Baldwin Chain & Mfg. Co., Worcester, Mass.
Bosch Magneto Co., New York City.
S. F. Bowser & Co., Fort Wayne, Ind.
Briscoe Mfg. Co., Detroit, Mich.
Brown-Lipe Gear Co., Syracuse, New York.
Byrne, Kingston & Co., Kokomo, Ind.
Champion Ignition Co., Flint, Mich.
The Connecticut Telephone & Elec. Co., Meriden, Conn.
Consolidated Rubber Tire Co., New York, N. Y.
Continental Caoutchouc Co., New York, N. Y.
Continental Motor Mfg. Co., Muskegon, Mich.
Covert Motor Vehicle Co., Lockport, New York.
The Wm. Cramp & Sons Ship & Engine Bldg. Co., Philadelphia, Pa.
The Dean Electric Co., Elyria, Ohio.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
The Diamond Rubber Co., Akron, Ohio.
Driggs-Seabury Ordnance Corp., Sharon, Pa.
Edison Storage Battery Co., West Orange, New Jersey.
The Edmunds & Jones Mfg. Co., Detroit, Mich.
Eisemann Magneto Co., New York City.
The Electric Storage Battery Co., Philadelphia, Pa.

Empire Tire Co., Trenton, New Jersey.
Firestone Tire & Rubber Co., Akron, Ohio.
The Fisk Rubber Co., Chicopee Falls, Mass.
G. & J. Tire Co., Indianapolis, Ind.
Gommer Mfg. Co., Detroit, Mich.
The B. F. Goodrich Co., Akron, Ohio.
The Goodyear Tire & Rubber Co.,, Akron, Ohio.
Gray & Davis, Amesbury, Mass.
C. T. Ham Mfg. Co., Rochester, New York.
The R. E. Hardy Co., Chicago, Ill.
A. W. Harris Oil Co., Providence, R. I.
The Hartford Rubber Works Co., Hartford, Conn.
Hartford Suspension Co., Jersey City, New Jersey.
Havoline Oil Co., New York City.
Herz & Co., New York City.
The Imperial Brass Mfg. Co., Chicago, Ill.
Isaac G. Johnson & Co., Spuyten Duyvil, N. Y. City.
Jones Speedometer Co., New York, N. Y.
Atwater Kent Mfg. Works, Philadelphia, Pa.
Kinsey Mfg. Co., Toledo, Ohio.
Kokomo Electric Co., Kokomo, Ind.
Leather Tire Goods Co., Niagara Falls, New York.
J. Ellwood Lee Co., Conshohocken, Pa.
W. H. Leland & Co., Worcester, Mass.
Link-Belt Co., Indianapolis, Ind.
Lovell-McConnell Mfg. Co., Newark, New Jersey.
McCord Mfg. Co., Detroit, Mich.
Michelin Tire Co., Milltown, New Jersey.
Morgan & Wright, Detroit, Mich.
A. R. Mosler & Co., New York City.
The Motz Clincher Tire & Rubber Co., Akron, Ohio.
Muncie Gear Works, Muncie, Ind.
National Carbon Co., Cleveland, Ohio.
National Coil Co., Lansing, Mich.
National Tube Co., Pittsburg, Pa.
N. Y. & N. J. Lubricant Co., New York City.
Oilver Mfg. Co., Chicago, Ill.
Pennsylvania Rubber Co., Jeannette, Pa.
Pittsfield Spark Coil Co., Dalton, Mass.
Remy Electric Co., Anderson, Ind.
The Republic Rubber Co., Youngstown, Ohio.
Ross Gear & Tool Co., Lafayette, Ind.
The Royal Equipment Co., Bridgeport, Conn.
The Sparks-Withington Co., Jackson, Mich.
Spicer Mfg. Co., Plainfield, New Jersey.
C. F. Splitdorf, New York City.
Standard Roller Bearing Co., Philadelphia, Pa.
The Standard Welding Co., Cleveland, Ohio.
Stewart & Clark Mfg. Co., Chicago, Ill.
Stromberg Motor Devices Co., Chicago, Ill.
Swinehart Tire & Rubber Co., Akron, Ohio.
The Timken-Detroit Axle Co., Detroit, Mich.
The Timken Roller Bearing Co., Canton, Ohio.
The Turner Brass Works, Sycamore, Ill.
The U. S. Light & Heating Co., New York City.
The Veeder Mfg. Co., Hartford, Conn.
Vesta Accumulator Co., Chicago, Ill.
Warner Gear Co., Muncie, Ind.
Warner Mfg. Co., Toledo, Ohio.
Weed Chain Tire Grip Co., New York City.
Western Motor Co., Marion, Ind.
Weston-Mott Co., Flint, Mich.
Wheeler & Schebler, Indianapolis, Ind.
Whitney Mfg. Co., Hartford, Conn.
J. H. Williams Co., Brooklyn, New York.
Federal Rubber Co., Cudahy, Wis.
Detroit Electric Appliance Co., Detroit, Mich.
Waukesha Motor Co., Waukesha, Wis.
The Esterline Co., Lafayette, Ind.
The Simms Magneto Co., New York City.
Falls Machine Co., Sheboygan Falls, Wis.
International Acheson Graphite Co., Niagara Falls, New York.
The Buda Co., Harvey, Ill.
Stutz Auto Parts Co., Indianapolis, Ind.
The United Rim Co., Akron, Ohio.
Jacobson-Brandow Co., Pittsfield, Mass.
General Electric Co., Schenectady, N. Y.

Chicago Show for First Week Only

Allen Auto Specialty Co., New York City.
Auburn Auto Pump Co., Boston, Mass.
Avery Portable Lighting Co., Milwaukee, Wis.
Booth Demountable Rim Co., Detroit, Mich.
Briggs & Stratton Co., Milwaukee, Wis.
Columbia Lubricants Co., New York, N. Y.
Continental Rubber Works Co., Erie, Pa.
Adam Cook's Sons, New York, N. Y.
C. Cowles & Co., New Haven, Conn.
Jos. Dixon Crucible Co., Jersey City, New Jersey.
Dorian Remountable Rim Co., New York City.
Dover Stamping & Mfg. Co., Cambridge, Mass.
The Globe Machine & Stamping Co., Cleveland, Ohio.
Gray-Hawley Mfg. Co., Detroit, Mich.
George A. Haws, New York, N. Y.
Haves Mfg. Co., Detroit, Mich.
Heinze Electric Co., Lowell, Mass.
The Hoffecker Co., Boston, Mass.
Kellogg Mfg. Co., Rochester, New York.
The McCue Co., Buffalo, New York.
The Pantasote Co., New York City.
J. H. Sager Co., Rochester, New York.
C. A. Shaler Co., Waupum, Wis.
A. O. Smith Co., Milwaukee, Wis.
The Sprague Umbrella Co., Norwalk, Ohio.
The Stein Double Cushion Tire Co., Akron, Ohio.
Valentine & Co., New York City.
Warner Instrument Co., Beloit, Wis.
Western Tool & Forge Co., Brackenridge, Pa.
The Willard Storage Battery Co., Cleveland, Ohio.
Doehler Die Casting Co., Brooklyn, New York.
The Hess Spring & Axle Co., Carthage, Ohio.
The G. Piel Co., New York City.
Universal Wind Shield Co., Chicago, Ill.
Universal Tire Protector Co., Angola, Ind.
Automombile Supply Mfg. Co., Brooklyn, New York.
The Batavia Rubber Co., Batavia, N. Y.
Double Fabric Tire Co., Auburn, Ind.
Voorhees Rubber Mfg. Co., Jersey City, New Jersey.
Wolverine Lubricants Co., New York City.
The Start-Lite Co., Chicago, Ill.
Gabriel Horn Mfg. Co., Cleveland, Ohio.

Mechanics' Hall, Boston, for Both Weeks

Ajax-Grieb Rubber Co., New York, N. Y.
The Baldwin Chain & Mfg. Co., Worcester, Mass.
Bosch Magneto Co., New York, N. Y.
S. F. Bowser & Co., Fort Wayne, Ind.
Coes Wrench Co., Worcester, Mass.
Columbia Lubricants Co., of New York, New York, N. Y.
Consolidated Rubber Tire Co., New York, N. Y.
Continental Caoutchouc Co., New York, N. Y.
The Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.
The Dean Electric Co., Elyria, Ohio.
The Diamond Rubber Co., Akron, Ohio.
The Electric Storage Battery Co., Philadelphia, Pa.
Empire Tire Co., Trenton, N. J.
Firestone Tire & Rubber Co., Akron, Ohio.
The Fisk Rubber Co., Chicopee Falls, Mass.
G & J Tire Co., Indianapolis, Ind.
The B. F. Goodrich Co., Akron, Ohio.
Gray & Davis, Amesbury, Mass.
A. W. Harris Oil Co., Providence, R. I.
The Hartford Rubber Works Co., Hartford, Conn.
Hartford Suspension Co., Jersey City, N. J.
The Hoffecker Co., Boston, Mass.
The Jones Speedometer Co., New York, N. Y.
Leather Tire Goods Co., Niagara Falls, N. Y.
J. Ellwood Lee Co., Conshohocken, Pa.
Morgan & Wright, Detroit, Mich.
A. R. Mosler & Co., New York City.
The Motz Clincher Tire & Rubber Co., Akron, Ohio.
National Carbon Co., Cleveland, Ohio.
N. Y. & N. J. Lubricant Co., New York, N. Y.
Pennsylvania Rubber Co., Jeannette, Pa.
Remy Electric Co., Anderson, Ind.
C. F. Splitdorf, New York, N. Y.
Swinehart Tire & Rubber Co., Akron, Ohio.
Vacuum Oil Co., New York, N. Y.
The Veeder Mfg. Co., Hartford, Conn.
Federal Rubber Mfg. Co., Cudahy, Wis.
International Acheson Graphite Co., Niagara Falls, N. Y.
United Rim Co., Akron, Ohio.
Jacobson-Brandow Co., Pittsfield, Mass.
Goodyear Tire & Rubber Co., Akron, Ohio.

Mechanics' Hall, Boston, for First Week Only.

Allen Auto Specialty Co., New York, N. Y.
Apple Electric Co., Dayton, Ohio.
Auburn Auto-Pump Co., Boston, Mass.
Booth Demountable Rim Co., Detroit, Mich.
Borne, Scrymser Co., New York, N. Y.
Champion Ignition Co., Flint, Mich.
Adam Cook's Sons, New York, N. Y.
Jos. Dixon Crucible Co., Jersey City, N. J.
Dorian Remountable Rim Co., New York, N. Y.
Dover Stamping & Mfg. Co., Cambridge, Mass.
Gabriel Horn Mfg. Co., Cleveland, Ohio.
Havoline Oil Co., New York, N. Y.
George A. Haws, New York, N. Y.
Heinze Electric Co., Lowell, Mass.
W. H. Leland & Co., Worcester, Mass.
Lovell-McConnell Mfg. Co., Newark, N. J.
Michelin Tire Co., Milltown, N. J.
National Coil Co., Lansing, Mich.
National Tuber Co., Pittsburgh, Pa.
Oliver Mfg. Co., Chicago, Ill.
The Pantasote Co., New York, N. Y.
Pittsfield Spark Coil Co., Dalton, Mass.
The Republic Rubber Co., Youngstown, Ohio.
Wm. C. Robinson & Son Co., Baltimore, Md.
C. A. Shaler Co., Waupun, Wis.
Stromberg Motor Devices Co., Chicago, Ill.
Valentine & Co., New York, N. Y.
Vesta Accumulator Co., Chicago, Ill.
Warner Gear Co., Muncie, Ind.
Werner Instrument Co., Beloit, Wis.
Weed Chain Tire Grip Co., New York, N. Y.
The White & Bagley Co., Worcester, Mass.
Detroit Electric Appliance Co., Detroit, Mich.
The G. Piel Co., New York, N. Y.
The Esterline Co., Lafayette, Ind.
The Batavia Rubber Co., Batavia, N. Y.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Wolverine Lubricants Co., New York City.
The Connecticut Telephone & Electric Co., Meriden, Conn.

Madison Square Garden, for Second Week Only.

Ross Gear & Tool Co., Lafayette, Ind.
Standard Roller Bearing Co., Philadelphia, Pa.
Whitney Mfg Co., Hartford, Conn.

GUSTAVE GOBRON, head of the Société Gobron-Brillie, and for many years a leader in automobile circles in France, is dead. He was born in 1846 and received high honors during his life. He was chevalier of the Legion of Honor.

ALBANY, N. Y., Oct. 9—William H. Catlin, state superintendent of roads, died recently. Col. Catlin had been at the head of the New York road department only a short time, but during his brief administration made many improvements.

Big Entry List for Santa Monica

LOS ANGELES, Oct. 6—Forty cars are promised to start in the four events to be run in the third annual road races at Santa Monica on Saturday, October 14. This is the largest entry list ever gotten together for any western road race. The course has been put in excellent shape and the drivers expect to see a new record set for the course, which has proven to be the fastest in America.

Three of the four events will be classified by piston displacement only, all of the events will be non-stock.

In the free-for-all, which will be twenty-four laps of the 8.417 mile course, some of the fastest cars in America will be contenders.

Heading the entry list is a Fiat 90, driven by Teddy Tetzlaff, who set a new American record on the course last year with a Lozier averaging 73.27 miles per hour. Harris Hanshue, who won the first Santa Monica race with an Apperson, will pilot a Mercer.

Bert Dingley has purchased and entered the Pope-Hartford that he drove into first place this year in the Oakland-Portola road race.

Harvey Herrick will pilot a National. Herrick won the Los Angeles to Phoenix road race of nearly 500 miles last year with a Kissel.

Another of the local Western drivers that will be well placed in this race is Joe Nickrent, who has joined forces with the Marmon team.

These Western boys will have to compete with Wilcox and his National, Joe Dawson, Bill Endicott and Cyrus Patschke of the Marmon team, Disbrow and his Ohio, T. S. Duby and the Midland six, Dave Lewis on the Stutz and Harry Endicott, with the Inter-state.

The National team will have Merz and Aiken in reserve to be used if necessary. Ray Harroun will be here as manager of the Marmon team and may decide to take the wheel of one of the cars himself. The heavy car class with its minimum limit of 301 inches and the medium class running from 231 to 300 will be run simultaneously. The distance will be 151 miles or eighteen laps of the course.

There are four entries so far in the heavy car class most of the drivers preferring to hold out for the free-for-all with its larger purse and finer trophy.

In the 300 and under class will be entered two Coles with Johnny Jenkins and Frank Siefert driving. Hanshue will pilot the Mercer, Joe Nickrent and Bill Endicott will have Marmons, Louis Nickrent will handle the Buick, C. E. Bigelow will pilot the Lexington, McKeague who drove the Durocar into first place in this class last year will try to repeat his winning. A Schacht and a Parry are promised but no drivers nominated as yet.

In the mosquito fleet, limited to 230 inches, the line-up will consist of the Maxwell that won last year, with Clarence Smith driving. Smith purchased the car and is entering it himself. Frank Charle will drive a Ford, Frank Siefert a Paige-Detroit, Louis Nickrent a Buick, and Anthony a Regal. Hanshue will be in this event also at the wheel of a Reo. This will give Hanshue 450 miles to go to finish in all of the three events in which he has entered. A Flanders and an E-M-F promised will complete the list for the midgets.

Bert Dingley, Frank Siefert, Joe Nickrent and Harvey Herrick are each entered in two out of the three races.

The course will be open for early morning practice to-morrow. The National team is here and has established a camp at Santa Monica, and will be out early to get the cars tuned up.

A number of the cars are ready for the final road tests and the coming week will see the residents along the course among the list of early risers whether it will be from choice or not.

Four big silver trophies are offered. The perpetual challenge cup given by Dick Ferris will go to the winner of the free-for-all. Leon T. Shettler's trophy will go to the winner in the heavy car class while two new trophies offered by Chanslor & Lyon and J. A. Jepson will go to the winners in the medium and light car class respectively.

In addition to the trophies over $10,000 in cash will be divided among the cars that run in the money. Part of the cash prizes are offered by tire and ignition firms and only cars carrying their equipment are eligible for that part of the purse. Races run over the Santa Monica course in former years have been productive of notable contests. The course is acknowledged to be one of the fastest and safest in the United States.

Colby Star Performer at Omaha

OMAHA, NEB., Oct. 9—The rain has proved the most consistent winner in the automobile races at the Omaha Speedway. The races were originally scheduled for September 30 and October 1, 2 and 4. They had to be postponed twice, but finally the first day's events were pulled off Wednesday, October 4. The second day's races were to have been held Friday, but again the rain interfered.

Pierce in a Colby carried off every contest he was allowed to enter on Wednesday in some of the fastest racing ever witnessed on this track.

In the 10-mile race for cars under 231 cubic inches displacement the Firestone-Columbus and Abbott-Detroit fought for first place throughout, the former winning by a quarter of a second.

In the first race the Colby was followed closely by the Firestone-Columbus and the Abbott-Detroit, but won the last easily. In a speed trial the Colby did 5 miles in 4:48. Following are the summaries:

10 Miles. 301 Cubic Inches Displacement or under

Position.	Car.	Driver.	Time.
1.	Colby	William Pierce	10:09
2.	Firestone-Columbus	Ed. Richenbacher	.....
3.	Chalmers	William Bruner	.....

10 Miles. Under 231 Cubic Inches Displacement

1.	Firestone-Columbus	Richenbacher	11:47¾
2.	Abbott-Detroit	Smith	11:48
3.	Chalmers	Bruner	.....
4.	Page-Detroit		withdrawn

25 Mile Free-for-All for Speedway Cup

1.	Colby	Pierce	24:52¾
2.	Firestone-Columbus	Rickenbacher	.....
3.	Abbott-Detroit	Smith	.....
4.	Paige-Detroit		withdrawn in fifth lap

Second Day

OMAHA, Oct. 10—The races in Omaha had to be postponed again until Sunday. Pierce in his Colby 40 again carried off the honor, winning the Speedway cup. Summary:

50-Mile Free-for-All

Position.	Car.	Driver.	Time.
1	Colby	Pierce	48:45½
2	Cutting	Ernest Delaney	70:23
3	Firestone-Columbus withdrew, end of 45th mile.		
4	Mercer	Baker	Withdrew

5-Mile Speed Trials

1	Colby	Pierce	4:44
2	Cutting	Delaney	5:21½
3	Firestone-Columbus	Rickenbacher	5:24½

Obstacle Race, 10 Miles

1	Mercer	Baker	19:09¾
2	Chalmers	Bruner	

Truck Wheel Standards Extended

At the meeting of the Division on Wheel Dimensions and Fastenings for Tires of the Standards Committee of the Society of Automobile Engineers held at the office of the society, 1451 Broadway, New York City, on Oct. 5 the following were in attendance: S. A. E. committee, W. P. Kennedy, chairma C. L. Schwarz, E. R. Whitney, C. B. Whittelsey, J A. Anglada and Coker F. Clarkson, secretary. Those representing the tire companies included H. W. Dupuy, Polack Tyre Company; A. Hauschild, Polack Tyre Company; E. R. Hall, Goodyear Tire & Rubber Company; W. H. Allen, The B. F. Goodrich Company; P. A. Aspell, The B. F. Goodrich Company; John C. Cole, Fisk Rubber Company; B. C. Swinehart, Republic Rubber Company; W. W. Wuchter, Swinehart Tire & Rubber Company; C. A. Swinehart, Swinehart Tire & Rubber Company; A. A. Brewster, Diamond Rubber Company; F. F. Phillips, U. S. Tire Company; J. L. Gibney, James L. Gibney & Bro.; J. W. Thomas, Firestone Tire & Rubber Company; S. G. Carschuff, Firestone Tire & Rubber Company; B. C. Swander, Firestone Tire & Rubber Company; E. Roberts, Kelly-Springfield.

The first subject taken up was the matter of a standard bolt hole circle for the flange type of solid motor tire. It was the sense of the meeting that the S. A. E. committee be requested to recommend the adoption of 1-2 inch as the diameter of through bolts for all sizes of solid motor tires.

Also that the diameter of the bolt hole circle for 36-inch tires should be 28 1-2 inches, and increase or decrease by even 2 inches for tires larger or smaller than 36 inches.

As to the number of bolts to be used, it was the sense of the meeting that for tires up to and including 36 inches diameter there should be 8, 12 or 24 bolts equally spaced where required; for tires above 36 inches and up to and including 42 inches there should be 10, 15 or 30 bolts equally spaced where required; for tires above 42 inches and up to and including 48 inches there should be 12, 18 or 36 bolts equally spaced where required and for tires above 48 inches and up to and including 54 inches there should be 14, 21 or 42 bolts equally spaced where required.

It was voted that the manufacturers of commercial motor vehicles should be requested to inspect wheels which they purchase according to S. A. E. standards and to mark the same with a symbol visible at all times in the life of the wheels.

William E. Metzger, president of the National Association of Automobile Manufacturers, expressed the gratification of the manufacturers as to the S. A. E. standardization work and the belief that they would fully support the particular standardization under consideration at this meeting, namely the truck wheel having a constant diameter for all widths of solid motor tires of a given diameter, and a permanent metal band of 1-4 inch thickness for some sizes and 3-8 inch for others, the idea being that this metal band should never be removed from the wheel under any circumstances, but remain as the common basic point from which all the makers of solid tires are to work, all special steel equipment necessary to the application of the respective makes of solid tires being attached to the outside of this permanent metal band.

The society has just announced the details of the S. A. E. screw standard which supplants the A. L. A. M. screw standard, which was adopted by the Association of Licensed Automobile Manufacturers in April, 1906. The standardizing of nuts and bolts was a work of such magnitude and far-reaching usefulness that it may well constitute an enduring monument. It was work akin to bringing order out of chaos. The standard was an almost immediate mechanical success, the good results being felt not more by manufacturers than by dealers and drivers.

The only changes which have been made by the S. A. E. in the old standard are as to the distance across flats of the heads and nuts of the 1-4, 7-16 and 3-4-inch screws, the changes being from 3-8 to 7-16, from 11-16 to 5-8 and from 1 1-8 to 1 1-16 inch respectively. The A. L. A. M. screw standard did not go beyond 1-inch diameter screw. The S. A. E. standard proceeds by 1-8 and including 1 1-2-inch diameter screw.

Calendar of Coming Events

Shows

Oct. 7-14.....Chicago, Ill., Show of Chicago Automobile Trade Association.
Jan. 6-13.....New York City, Madison Square Garden, Twelfth Annual Show, Pleasure Car Division, Automobile Board of Trade.
Jan. 6-20.....New York City, Madison Square Garden, Annual Show, Motor and Accessory Manufacturers.
Jan. 10-17.....New York City, Grand Central Palace, Twelfth Annual Show, National Association of Automobile Manufacturers; also Motor and Accessory Manufacturers.
Jan. 15-20.....New York City, Madison Square Garden, Twelfth Annual Show, Commercial Division, Automobile Board of Trade.
Jan. 27-Feb. 10....Chicago Coliseum, Eleventh Annual Automobile Show under the auspices of the National Association of Automobile Manufacturers. Pleasure cars, first week. Commercial vehicles, second week.
Feb. 14-17.....Grand Rapids, Mich., Third Annual Show.
Feb. 19-24.....Hartford, Conn., Annual Show, Automobile Club of Hartford, State Armory.
Week Feb. 22.....Cincinnati, O., Annual Show, Cincinnati Automobile Dealers' Association.
March 2-9.....Boston, Mass., Tenth Annual Show, Boston Automobile Dealers' Association, Inc.

Meetings, Etc.

Nov. 20-24.....Richmond, Va., First American Road Congress, under auspices of American Association for Highway Improvement.
Nov. 23.....Road Users' Day, under direction of Touring Club of America.
Jan. 18-20.....New York City, Annual Meeting of the Society of Automobile Engineers.

Race Meets, Runs, Hill-Climbs, Etc.

Oct. 9-13.....Denver, Colo., Reliability Run, Denver Motor Club.
Oct. 11-18.....San Francisco, Cal., Reliability Run, Good Roads Assn. of Northern California.
Oct. 13-14.....Peoria, Ill., Track Races, Peoria National Implement and Vehicle Show.
Oct. 14.....Santa Monica, Cal., Road Races.
Oct. 14 (to 26)....New York City, Start of the Annual Glidden Tour, en route for Jacksonville, Fla.
Oct. 30.....Minneapolis, Minn., Hill Climb.
Oct. 20-21.....Sioux City, Iowa, Track Races, Sioux City Automobile Club.
Oct. 21.....Atlanta, Ga., Track Races.
Oct. 21.....White Plains, N. Y., Track Races, Westchester Driving Club.
Oct. 27-Nov. 3.....Chicago, Ill., Thousand-Mile Reliability Run, Chicago Motor Club.
Oct. 28.....Newark, N. J., Reliability Run, Newark Motor Club.
Oct. 30.....Harrisburg, Pa., Economy Run, Motor Club of Harrisburg.
Oct. 31.....Shreveport, La., Track Races, Shreveport Automobile Club.
Nov. 2-4.....Philadelphia, Reliability Run, Quaker City Motor Club.
Nov. 3-4.....Columbia, S. C., Track Races, Automobile Club of Columbia.
Nov. 4-6.....Los Angeles-Phoenix Road Race, Maricopa Auto Club.
Nov. 9.....Phoenix, Ariz., Track Races, Maricopa Automobile Club
Nov. 9, 10, 12.....San Antonio, Tex., Track Races, San Antonio Auto Club.
Nov. 27.....Savannah, Ga., Vanderbilt Cup Race, Savannah Automobile Club.
Nov. 30.....Los Angeles, Cal., Track Races, Motordrome.
Nov. 30.....Savannah, Ga., Grand Prize Race, Savannah Automobile Club.

THE AUTOMOBILE

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THE CLASS JOURNAL COMPANY

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Comfort Is Essential

AUTOMOBILE buyers are looking for comfort in the cars they are going to purchase for the coming year. Two or more years ago the buyer did not give comfort much thought; he was glad to get a car in those halcyon days and it was of more concern to him to get a car with a good motor, a good gearset and a good running gear than one with special body comforts. To-day the situation is different. The majority of the buyers acknowledge that there are over two-score cars in which the motors are so well made that they will give all that is demanded in the matter of satisfaction; there are to-day two-score or more cars in which the gearsets and axles meet the expectations of the most fastidious; but there are not so many cars to-day that give everything that is asked for in the way of easy riding. Easy riding and comfortable seats with comfortable foot room are factors that will sell cars for 1912. Take two cars of equal reputation for stability in the motor, clutch, gearset and axles, that car with the better body suspension, with the better upholstery and with the more foot-and-leg comforts will prove the better seller. Some makers have grasped this idea already; they are up to date: others will grasp it when they have allowed the rival to get the benefit of the early bird.

It is natural that good spring suspension should be a factor in determining which automobile is to be purchased. It is natural that the woman who has to ride in the tonneau should instruct her husband to purchase the car that is the more comfortable to ride in. Not a few sales of 1912 cars have been clinched by the verdict of the tonneau should instruct her husband to purchase the motor of one may be better than that of another; the magneto on one may have some advantages over that of the other; but to the rear-seat passenger the comfort factor is one that cannot be overlooked. It is a prime consideration in the matter of selling cars; it is so important in these days when real salesmanship is needed that those concerns whose cars have stiff springs and uncomfortable seats will discover that it is time to use good springs, good upholstery and other body comforts.

The automobile manufacturer must wrestle with the matter of passenger comfort. Some are doing it to-day, but they have not succeeded as well as others. Naturally the first offered solution is that of fitting shock absorbers. This is a good solution providing the shock absorber is suited to the car load, and further provided that the absorber is kept in proper adjustment. But a shock absorber adjusted to a three-passenger load in a big touring car will not act well if seven or eight adults are in the machine; on the other hand, when the shock absorber is adjusted to a load of seven people the car suspension will not be the best when there is one lone person in the back seat. A simple solution would be the fitting of a device to the shock absorber that would allow of very quickly changing the adjustment to suit the different loads; but what driver would think of making the adjustment? Such an adjustment should be made before going on long cross-country trips.

The final solution of the problem is an engineering one. It is not always the shock absorber and it is not always the set of springs; the general design of the car plays its part. Every car owner has ridden in automobiles that will hold the road perfectly at fairly high speeds, whereas others at the same speed will be jumping all over the road. The reason is at hand: One is a well-balanced car, the other one is poorly balanced. The well-balanced car, if it holds the road perfectly, must of necessity ride more easily. It may not have much better springs than the poorly-balanced car, it may not have any better shock absorbers, but still it is a more comfortable car; it is a better-balanced car.

The matter of balance is attracting the attention of engineers to-day, but they do not know enough about the other engineer's car to pick out the bad points in their own. There is a solution, at least there is a way of bringing to the attention of the engineers that matter of suspension, and that is a contest in which suspension will be featured. In the early days of the automobile, when the cars were not properly braked, it was the reliability runs over the mountainous roads that impressed on the makers the necessity of more and better braking surface; when fenders were not strong enough to withstand continuous rough road usage it was the technical examination at the end of the endurance run that impressed it on the engineer; and to-day there is not any reason why a test on suspension would not serve to inform the engineer of the exact status of the suspension of his car. Such a test would not be a difficult one. It would require the attachment of some form of pointer, or needle, to the car axle and another needle to the car frame. Both should trace their up-and-down movement, or vibration, on a chart. All of the contesting cars would be fitted with the same device, which could be so designed as to be readily attached to any car. With a device of this nature in place, all of the contesting cars, with required load, would have to drive at different speeds over a certain surface, which might contain such road irregularities as street car crossings, cross ridge, cross rut and other holes. The tracings of the pointers on the chart would tell the story. There would not be any chance for deception in such a contest. The expertness of the driver would be a factor as it is in any form of contest, but in spite of this the test would be a really practical one. It would be an eye-opener to a good few makers. It would be a car seller to the concerns that had a good suspension.

There are some body comforts which are factors in making car sales, which call for immediate attention. It is a certainty that some of the engineers would never have made the clutch and service brake pedals so high if they had driven the car for an entire day. In others the sloping part of the floor boards in front is too short to accommodate the foot without the toe of the shoe rubbing against the highly-finished mahogany dash. The dash is soon disfigured. A little common sense would have remedied this before the car left the designing department. On some cars it is impossible for one person to ride with any degree of comfort in the tonneau seat. Instead of there being a comfortable rearward slope to the upholstery, there is a forward slope tending to throw the passenger ahead. At other times the foot rail is either too far away or too near, and without any means of adjustment. The lack of body comforts could be enlarged upon, but it is not necessary. It is becoming more and more a necessity and the time is at hand when body comforts will be perhaps more of a selling factor than the particular make of carbureter, magneto or axle used. It is a field to which makers should give attention.

Twenty Three-Car Teams in Glidden

SHARPLY at 9 o'clock Saturday morning, the touring column of the 1911 Glidden Tour will start from Fifth avenue and Thirty-ninth street on its journey to Jacksonville, Fla. The procession will be headed by a platoon of mounted police, behind which will be ranged 82 automobiles. Of this number 72 will be contestants for the Glidden Trophy or for the individual trophy offered by the city of Anderson, S. C.

Arrangements have been made with the State of New Jersey for touring privileges. For a time this phase of the tour looked dark as the officials of the State said that they wanted a full yearly touring license from each entrant and official car for the privilege of passing through the sacred precincts. This rule was later modified for the sake of general results and the tourists will not be required to take out licenses for a year.

The course will be across the Cortland street ferry, where the cars will be officially checked out. From there the route carries the party through Jersey City and Newark, reaching Philadelphia late in the afternoon.

Any State license carried by automobiles in the column will be good everywhere else that the route touches. In Virginia the cars will have to bow to the mediæval toll-gate regulations and it is understood that the rates have been raised down through the Old Dominion on the broad general ground that times are hard.

There will be approximately twenty three-car teams contesting for the Glidden Trophy. The other dozen cars will go along for the individual prize.

The teams so far as they have been formed are as follows:

Atlanta Team 1: Flanders 8, C. S. Winn; Flanders 61, E-M-F Atlanta Company; Flanders 63, Decatur, Ga. Board of Trade.

Tarrytown team: Maxwells 1, 2 and 3, U. S. Motor Company.

Nashville team: Marathons 56, 57 and 58, entered by J. M. Downing, Dr. R. L. Dozier and Dr. Vernon Hutton.

Atlanta Journal team: Inman Gray, American 5; James R. Gray, Thomas 6; Maj. J. S. Cohen, White 7.

Waltham team: Metz 15, 16 and 17, Metz Company.

Albany, Ga., team: Halladays 34, 35 and 36, entered by D. P. DeBerry, C. E. Fryer and Streator Motor Car Company.

Atlanta team 2: C. H. Johnson, Stevens-Duryea, 11; Crawford Wheatley, Stevens-Duryea, 39; Brooks Morgan, Stevens-Duryea 66.

Detroit team: Flanders 53, 54 and 55, entered by the Studebaker Corporation.

Atlanta team 3: St. E. Massengale, Garford 18; L. C. Brown, Mitchel 19; Griffith Implement Company, Schacht 20.

Atlanta team 4: Fords 43, 44 and 45, entered by Carolina Portland Cement Company, E. M. Willingham and I. O. Teasley.

Atlanta team 5: E. P. Ansley, Pierce-Arrow, 10; B. M. Grant, Marmon, 12; E. Rivers, Pierce-Arrow, 64.

Atlanta team 6: Hoke Smith, Maxwell 4; William D. Alexander, White, 14; J. Epps Brown, Thomas 22.

Athens-Commerce team: C. J. Hood, Columbia, 24; Athens Motor Car Company, Columbia 49; Bishop and Varner, Maxwell, 50.

South Georgia team: W. E. Aycock, Moultrie, Knox, 25; Henry Tift, Tifton, Rambler, 38; Martin and Reese, Hahira, Cadillac, 59.

Ad Men's Club team: Atlanta Club, Corbin, 21; Anderson, S. C. Club, Mitchell; Greensboro Chamber of Commerce, Case, 71.

In addition to the foregoing there will be fifteen Florida cars, mostly Cadillacs which will be formed into five more teams. Some of the remaining individual entrants may team up with friends and acquaintances just before the column of automobiles is sent away.

New A. B. of T. Committees Named

The new committees for the year were announced at the quarterly meeting of the members of the Automobile Board of Trade, held last week at the New York headquarters, 7 East Forty-second street. The new committees are as follows:

Patents—C. C. Hanch, W. H. Van Dervoort, L. H. Kittredge, A. Macauley.

Legislation and Law—G. H. Stilwell, Wm. B. Hoyt, Albert L. Pope.

Trade—H. O. Smith, E. R. Benson, W. E. Metzger, C. W. Churchill, W. T. White.

Intercourse and Arbitration—G. E. Daniels, W. C. Shepherd, J. W. Gilson.

Good Roads—R. D. Chapin, S. D. Waldon, J. N. Willys.

Statistical—Benj. Briscoe, E. P. Chalfant, J. S. Clarke.

Publicity—Alfred Reeves, E. R. Estep, H. W. Ford.

Show—George Pope, Alfred Reeves, M. L. Downs.

Mechanical Co-operation—A. L. Riker, D. Ferguson, F. B. Stearns, C. W. Nash, H. E. Coffin.

Road Enthusiasts Will Tour to Richmond

Several road tours with Richmond, Va., as the objective point are being organized by good roads associations in various sections. The tours that are forming will be composed of those working for and interested in the good roads movement who purpose to attend the forthcoming convention of the American Road Congress at Richmond, November 20-24, under the auspices of the American Association for Highway Improvement.

The Touring Club of America reports that among the tours being projected are the following: From Quebec, under the direction of Howard D. Hadley, covering Canada, New England and New York; from Atlanta, under the leadership of Leonard Tufts, taking in a large part of the South and another tour from the Southwest, particularly reaching Tennessee.

Electrics at the Palace

THE new Grand Central Palace opened its doors Wednesday to the Electric Exhibition. The main floor contained appliances for electrical cars, both pleasure and commercial, as well as for motors and other electrical devices. An opening lunch was given by the Edison Electric Company to the different exhibitors on the first floor, which afterwards is to be used as a demonstration ground for interested spectators to take trials of the vehicles. A model garage is being erected on this floor to show the latest improvements in the matter of fittings.

A goodly number of manufacturers of electrically propelled vehicles have taken space and are exhibiting different models of their manufacture. They have taken the situation in hand wholeheartedly and feel confident that in the field to which they particularly cater, viz., the town and suburban service, they are holding their own. The question of batteries, according to one prominent manufacturer, is no longer the bugbear to be overcome. These have been greatly perfected in the last few years so that it is now possible to cover a large area without recharging. With this and the improvements made in construction in general the mileage radius has been materially increased. Pneumatic tires are extensively used on pleasure cars, but the cushion type tire is favored by some, as it relieves the driver of all anxiety on this score, at the same time rendering the vehicle simple to handle—a great feature in cars intended for ladies' use.

The general characteristic features of the chassis and suspension of the gasoline car shows signs of being more closely followed and in the case of a few makers runabouts have been built resembling the gasoline runabout, with wheel steering and control on the wheel. Among these may be mentioned the Detroit electric and the Bailey. The makers of the latter have on exhibition a runabout that is capable of attaining a speed of 30 miles per hour and the identical car shown ran from Boston to New York in 12 hours' running time, averaging 20 miles per hour.

Shaft drive for the pleasure electric seems to be making converts and one maker who caters to both trades stated that he was selling many more shaft-driven electrics than the chain-driven variety. Practically every car on exhibition in the main hall was fitted with independent brakes operating on drums attached to the driving wheels, controlled by a pedal independent of the motor brake, which is operated by the control lever. Various types of control are shown and this part of the cars' mechanism seems to have been simplified.

A note struck by one manufacturer seems to be a possible solution of one of the difficulties at present in the minds of prospective buyers of commercial vehicles. Salesmen in their endeavor to make sales are not confining themselves to facts, and instead of coming out in the open and stating that the electric vehicle is primarily a town and short delivery vehicle are endeavoring to overestimate its value. Most of the makers are turning out at least one and in some cases two new models for the coming season. The general feeling is that when people become more educated to the possibilities of the electric that many more sales will result.

The Edison Company is placing two new batteries on the market similar in construction to the present type, but with larger capacity. They will be known as the A-10 and A-12 types, for 3 1-2 and 5-ton work respectively. The unit is comprised of 60 cells and the A-10 type has a 275 ampere-hour capacity, while the A-12 type has a capacity of 450 ampere-hour. The weight of each cell respectively is 32 and 29 pounds.

Detroit in Week's News

DETROIT, MICH., Oct. 9—As a result of a movement now under way in the Detroit Board of Commerce, shipments of Detroit-made automobiles to South America and other foreign markets are likely to be very materially increased in the future. The first steps toward the organization of an export bureau, as an adjunct of the board, were taken last week, when President Milton A. McRae pointed out the possibilities that await local manufacturers in many of the foreign markets, especially in South America.

The Elmore Automobile Company, 754 Woodward avenue, has taken the agency for the Reo.

In addition to the extensive improvements that are being made at its Detroit plants, the Studebaker Corporation is planning to add 40,000 square feet of floor space to its Windsor plant. The Dominion Stamping plant, which is a branch of a Detroit company, will also be enlarged.

The Harger Steam Truck Company, of New York, has been organized by several prominent Detroiters, headed by John S. Harger.

Rotary valve construction was the subject of an interesting discussion at the meeting of the Detroit chapter of the Society of Automobile Engineers, Friday evening.

Bristol Scouts Reach Washington

RICHMOND, VA., Oct. 9—The highway scouts promoting the connecting link in the National Highway between Bristol, Tenn., Va., and Washington, D. C., met with rousing receptions at every stopping point and reached Washington to-day.

The scouting party left Bristol with five cars in line.

After attending the third annual meeting of the Appalachian Good Roads Association the scouts started on a tour of the Shenandoah Valley, on the way to Washington.

Flanders Stars at Bedford Climb

INDIANAPOLIS, IND., Oct. 11—About 4,000 persons attended the hill climb held on Bright's Hill, Bedford, an 8 per cent. grade. There were no serious accidents. Spectators were present from a radius of 100 miles and the climb was arranged by motor car interests of Bedford. A summary of events follows:

Cars of 230 Cubic Inches and Under

Pos.	Car.	Driver	Time
1	Flanders "20"	Clayton Pierce	:53⅗
2	Flanders "20"	Frank B. Willis	
3	Buick	D. H. McCoy	

Cars of 231 to 350 Cubic Inches

1	Marion	Ira Matthews	:47⅘
2	Westcott	John D. Glover	

Free-for-All

1	Flanders "20"	Clayton Pierce	:42
2	National "40"	Ross McCoy	
3	Pope-Hartford	Frank Fox	

Bad Weather Kills Danbury Meet

DANBURY, CONN., Oct. 7—The automobile races which were to be held in connection with the county fair here were called off by Secretary Schumaker, of the Contest Board of the A. A. A., owing to the slippery condition of the track following the rain.

The track is a half-mile dirt course of elliptic shape. The stretches are comparatively long, making sharp turns at either end of the ellipse. It was on this track that De Palma went through the fence two years ago and sustained a broken leg. Two other drivers went through the fence at the same spot last year. The track was in good condition when these accidents happened.

Place and Show Money in Savannah Races

SAVANNAH, GA., Oct. 9—Additional purses for the placed cars in the Vanderbilt Cup, Tiedeman Trophy and Savannah Challenge Cup races have been hung up by the Savannah Automobile Club. In the Vanderbilt, a second prize of $500 and a third prize of $250 have been offered, while in each of the other races second money amounting to $250 and third money of $125 will be paid.

Springfield Sees Races

SPRINGFIELD, ILL., Oct. 9—The automobile races on Saturday, the closing date of the Illinois State Fair, served to draw out the largest crowd of the week.

The large crowd was only partially pleased with the meet, the close finishes which were staged and the lapping of cars at the grand stand being the only redeeming features of the exhibition.

There were only three real races in the entire card, the pursuit, the special race for the club championship and the 5-mile battle between the two Staver-Chicagos and the Case. All the others were flukes and failed to excite applause or appreciation.

McNay drove a great race in the Illinois Club championship, winning the $600 trophy for the Springfield automobile club from Monckmeier in his Staver-Chicago, representing the Chicago Motor Club, after Wonderlick, representing Bloomington in a Buick, had dropped out in the second mile.

Heineman, driving a Case, defeated Monckmeier in the 5-mile race with Knudson, also in a Staver-Chicago, third. The summary:

Match Race, 2 Miles; Automobile Versus Aeroplane

Car.	Driver	Position	Time
Marmon	Harroun	1	2:49¼
Wright-Biplane	Turpin	2	

Stock Cars, 2 Miles

Staver-Chicago	Monckmeier	1	2:22
Staver-Chicago	Knudson	2	

Time of tire change, 54½ seconds.

Exhibition, 3 Miles with Tire Change

Marmon	Harroun		3:28

Handicap, 3 Miles

Marmon	Harroun	1	3:25
Case	Heineman	2	

Class C, 300 Inches and Uunder, 5 Miles

Case	Heineman	1	5:38¼
Staver-Chicago	Monckmeier	2	
Staver-Chicago	Knudson	3	

Free-for-All, 3 Miles

Mercedes	Burman	1	2:52⅛
Hotchkiss	Kilpatrick	2	
Benz	McNay	3	

Illinois Club Championship

Staver-Chicago	McNay	1	10:21½
Benz	Monckmeier	2	

Free-for-All Handicap, 5 Miles

Staver-Chicago	Monckmeier	1	4:29
Staver-Chicago	Knudson	2	
Hotchkiss	Kilpatrick	3	

Bergdoll Won Fairmount

(*Continued from page* 611.)

cian must be carrier over the full route except in case of illness. As the claim has not been advanced that Willoughby was taken suddenly ill, the referee had nothing else to do but to disqualify the car.

The appearance of the stands was somewhat different from last year. According to the new rules, the pits must be stationed at least 15 feet away from the nearest portion of the stands. As the Fairmount Park course is quite narrow at the place used for the official stands, it was found necessary to remove the pits to the west side of the main seats and entirely away from the view of the press and official quarters.

Thus, when a car signalled the pits from the upper end of the home stretch, it was with much difficulty that the newspapermen and officials could determine its identity until it started away again. There was very little mechanical difficulty experienced by the cars. The Fiat and Mercer No. 5 were the only ones to succumb to such. It was found functional trouble that put out the Cole, while the sole accident of the day fell to the lot of the Case. It was plain slowness and tire trouble that ailed the other losers. Only about half of the tire repairs were made at the pits, thus the impression was received that there was an abnormal lack of tire trouble for the Fairmount Park course. This was not true, because the cars averaged about four changes during the running, but the changes were largely made out of range of the official stands.

Chairman Edwards was exceedingly active. Prior to the race he examined the cars, measuring the cylinders to establish their classes. He acted as assistant starter and during the race itself he maintained a kind of running inspection of the cars to insure against accidents that might happen as the result of neglected wear and damage.

At the finishing line he nodded to the starter to wave the various flags. Not once did he order the white flag used, signifying danger, but on two occasions he authorized the yellow signal which meant that the drivers must continue with caution.

One of these occasions was in the early part of the race when a car in making tire changes on the back stretch, failed to clear the whole width of the course. The yellow flags waved for two rounds, which probably caused several of the cars to lose ground as a result of obedience to orders. It was frequently remarked at the time that the warning was displayed too long, but on the other hand, no accident happened, as it might have done if the cars had been allowed to go over the course at full speed despite the partial obstruction of the track.

The officials all performed their duties with admirable precision and all are deserving of commendation.

The timing and scoring were excellently done. The mechanical timer worked splendidly and the Quaker City Timers' and Scorers' Club under the direction of President Paul B. Huyette checked and posted the lap scores with much celerity and exactness.

The score-board was divided into squares representing each lap and the elapsed time was painted into the squares after it had been announced by megaphone to the press and the grandstands.

A few errors were made, but these were corrected almost instantly and by the time the last car had finished, the complete standing of all the contestants had been posted in detail on the board.

Best Laps at Fairmount Park

Fastest laps made by the cars in the Fairmount Park 200-mile road race. The length of the course is 8.1 miles according to survey and is not what is known as a fast course owing to the number of bends in its length.

Class 3-C

No.	Car.	Lap.	Time.	M.P.H.
4	Cole	4	9 min. 20 sec.	52
5	Mercer	10	8 06	60
7	Case	10	8 24	57.8
11	Mercer	15	8 04	60.3
12	Ohio	6	8 51	55
19	Ohio	12	9 37	50.5

Class 4-C

No.	Car.	Lap.	Time.	M.P.H.
6	National	9	8 min. 12 sec.	59.2
10	Stutz	12	8 38	56.2
16	National	12	8 01	60.6

Class 5-C

No.	Car.	Lap.	Time.	M.P.H.
3	Lozier	25	7 min. 34 sec.	64.5
9	Lozier	19	8 00	60.8
12	National	23	7 43	63
17	Mercedes	25	7 41	63.3
18	Mercedes	8	8 10	59.5

Class 6-C

No.	Car.	Lap.	Time.	M.P.H.
8	Benz	2	7 min. 28 sec.	65.5
15	Fiat	2	7 49	62

Wishart Says He Will Take an Appeal

Spencer Wishart, driver of Mercedes 17 in the Fairmount Park road race decided Monday, has declared that he will file an appeal with the Contest Board against the ruling of Referee Dunlap which disqualified his mount after the car had finished first in Division 5C. Wishart has until Thursday night to perfect his appeal.

NEWS of the WEEK CONDENSED

SYRACUSE, N. Y.—On September 30 foremen and assistant foremen of the H. H. Franklin Manufacturing Company held their annual clam bake at Pleasant Beach on Onondaga Lake, near Syracuse. Besides the clam dinner and the usual trimmings, baseball games and other impromptu sports helped make the day a very enjoyable one.

COLUMBUS, OHIO—The Charles Shiear Motor Car Company, Fourth and Spring streets, has taken the 1912 agency for the Hupmobile.

OMAHA, NEB.—The Auburn factory has just opened a branch here. W. T. Wilson will be the manager of the Omaha-Auburn Auto Company.

INDIANAPOLIS, IND.—O. H. Pearsall has been appointed general agent for Ideal motor trucks and has established quarters at 44 South Senate avenue.

OMAHA, NEB.—The E. R. Wilson Automobile Company has taken the agency for the Paige-Detroit car. The company at present handles the Lexington.

OMAHA, NEB.—The Marion Automobile Company has taken the agency for the Marmon cars. The company already has the Marion and Overland cars.

COLUMBUS, OHIO—O. G. Roberts & Company, 933 East Gay street, has closed contracts to handle the Marmon and Overland in nine counties in central Ohio for 1912.

BOSTON, MASS.—The S. G. V. agency is now located on Boylston street in the salesrooms formerly occupied by the Napier company, having moved from Ipswich street.

CONCORD, N. H.—The New Hampshire Automobile Company, of which W. E. Darrah is proprietor, has contracted to represent the Franklin Automobile Company this season.

ELMIRA, N. Y.—The Southern Tier Motor Company has been signed up by the Franklin Automobile Company as its representative in this locality. G. W. Shoemaker is president.

HARTFORD, CONN.—The Automobile Club of Hartford has undertaken the publication of a monthly magazine, to be known as *The Bulletin*. The magazine will make its initial appearance next month.

WILMINGTON, DEL.—The Bowe Carriage Company, of this city, has completed a fine automobile ambulance for the Phoenix Fire Company, which is ready for delivery and will be placed in service during the coming week.

SYRACUSE, N. Y.—A. A. Ledermann, formerly of Utica, has opened offices in the Rosenbloom building on South Salina street, where he will carry a full line of Pierce-Arrow automobiles and motor trucks.

ANDERSON, IND.—The Remy Electric Company has announced that $400 will be given the drivers taking first, second and third places in the Los Angeles-Phoenix great desert road race, November 4 and 6, 1911.

SYRACUSE, N. Y.—W. E. Hookway has formed the Hookway Motor Truck Company to handle the Atterbury line and the Reliance. Mr. H. T. Windel, formerly salesman for the Buick, is manager of the company.

GRAND RAPIDS, MICH.—The Moran Auto Sales Company has moved from its old location on Kent street to 91 Jefferson avenue, the garage formerly operated by the Riley Auto Company, whose stock has been taken over.

NEW YORK CITY—Fred P. Nehrbas, formerly connected with the Thomas Motor Car Company, has become factory manager of the American Locomotive Company's plant at Providence, where the Alco cars and Alco trucks are built.

COLUMBUS, OHIO—The Oscar S. Gear Automobile Company, 288 East Long street, has taken the agency in seven counties in Central Ohio for the Oldsmobile and Oakland for 1912. The Kelly truck will be represented in the same territory.

COLUMBUS, OHIO—The Cummins Auto Sales Company, 153-155 North Fourth street, has taken the central Ohio agency for the Elmore for 1912. Subagents have been contracted for as follows: Cambridge, E. O. Fogle; Thornville, D. S. Spangler.

RICHMOND, IND.—The following dealers have been given the agency for the Westcott line for 1912: Price Implement Company, Zanesville, Ohio; Ye Motor Shop, Connersville, Ind.; W. H. Miller, Champaign, Ill., and George J. Smith, Peoria, Ill.

DETROIT, MICH.—Joseph E. Warren has recently become connected with the Metzger Motor Car Company, of Detroit, manufacturers of the Everitt. Mr. Warren will be associated with Sales Manager Hood, in the capacity of chief of district managers.

BOSTON, MASS.—A 3-ton Board recently completed a 500-mile trip from Washington to this city in 4 1-2 days. The truck was finished just one day previous to the start of the trip. It carried 6,458 pounds of merchandise and ran on a schedule averaging 100 miles each day.

COLUMBUS, OHIO—The Reliance Truck & Garage Company, 111 East Lynn street, has closed contracts to handle all of the lines of the General Motors Truck Company, which will include electrics and gasoline trucks and delivery wagons. George Bohn is general manager.

ATLANTA, GA.—The Atlanta Automobile & Accessory Association held its annual

banquet on Tuesday last. Plans were discussed for the holding of races on the Atlanta Speedway the day the Glidden tourists are in Atlanta, October 23, but nothing definite was done.

COLUMBUS, OHIO—Kimmell Brothers, 215 North Fourth street, have taken the agency in this section for the Speedwell and Empire for 1912. Subagencies have been contracted for the Empire as follows: Point Pleasant, W. Va., Edward L. Felson; Dayton, Ohio, Baker & Weaver.

PONTIAC, MICH.—The contract for a combination automobile chemical and hose wagon to cost $5,000 was awarded the American-LaFrance Company, of Elmira, N. Y., by the city commission. The wagon is to be built especially for the city's requirements and will be ready for delivery about the last of December.

NEW YORK CITY—William H. Chadwick has been appointed superintendent of the New York branch of the Locomobile Company of America. He will have entire charge of the mechanical and service departments. Mr. Chadwick was formerly with the Bosch Magneto Company, where he handled the repair and service departments.

OMAHA, NEB.—The dealers in Omaha took advantage of the Fall Ak-Sar-Ben carnival last week to have a garage show. All of the salesrooms were handsomely decorated, and special forms of displaying the cars were adopted. Automobile Row proved a rival to the street fair in attracting attention, and many cars were sold during the week.

PHILADELPHIA—Plans for a handsome two-story brick and terra cotta front clubhouse to cost in the neighborhood of $100,000 are being prepared for the Automobile Club of Philadelphia. The new home of the organization will be located at the southeast corner of Twenty-third and Ludlow streets, having a frontage of 136 feet and a depth of 152 feet.

FINDLEY, OHIO—The work of taking an inventory of the Findley Motor Company's stock under the direction of Receiver John M. Barr has begun and will probably take ten days. Coupled with this fact comes the announcement that eastern stockholders of the company are working out a plan for reorganizing the company, and that the same will be promulgated shortly after an inventory is filed.

WILKES-BARRE, PA.—J. H. Fleming, proprietor of the City Hall Garage, has been selected to handle the Matheson "Silent Six" cars in Scranton and Lackawanna county, Pa. On Saturday, September 30, a dinner was served at the Hotel Jermyn to the officers of the Matheson company and their guests, after which a general demonstration of all the Matheson "Silent Six" models was made.

MILWAUKEE, WIS.—The Chamber of Commerce has purchased a Buick light delivery car for its weighing and inspection department. Among the many advantages of motor service it has been found that with the truck samples of grain can be delivered on the floor of the chamber about one hour earlier than formerly, giving a big advantage to cash traders, to whom an hour a day is worth thousands.

NORWALK, OHIO.—The application for the transfer of the bankruptcy matter of the Norwalk Motor Car Company from Ben B. Wickham, referee for Huron county, to some other person on the ground that he is a stockholder in the company and an interested person, was acted upon favorably by Judge Killets, at Toledo. The judge appointed Frank E. Seager, of Fremont, referee in bankruptcy for Sandusky county, to have charge of the matter.

GRAND RAPIDS, MICH.—Grand Rapids' Third Annual Automobile Show is scheduled for February 14-15-16-17, 1912. By the selection of these dates it will again be possible for exhibitors at the Chicago show to come directly to the Grand Rapids exposition. The show will be held either in the Klingman building, as heretofore, or in the new Coliseum. C. L. Merriman, of the Herald Publishing Company, will have charge of space allotments.

TOLEDO, OHIO—The big addition to the Willys-Overland Company's plant at Toledo is nearing completion. The new building is four stories high, 300 feet wide and 400 feet long and of concrete construction. It was expected that with the completion of this addition all Overland cars could be constructed in Toledo, but an announcement has been made that the concern has been forced by the volume of trade to continue operations at the Indianapolis plant.

BUFFALO, N. Y.—The local Automobile Trade Association gave Mr. Norman E. Oliver a farewell dinner at the Automobile clubhouse Saturday, September 30. Mr. Oliver has been manager of the Diamond Rubber Company, of Buffalo, for the past ten years and has been promoted to secretary and general manager of the New York branch of the Diamond Rubber Company, which covers the States of New York, Pennsylvania and New Jersey.

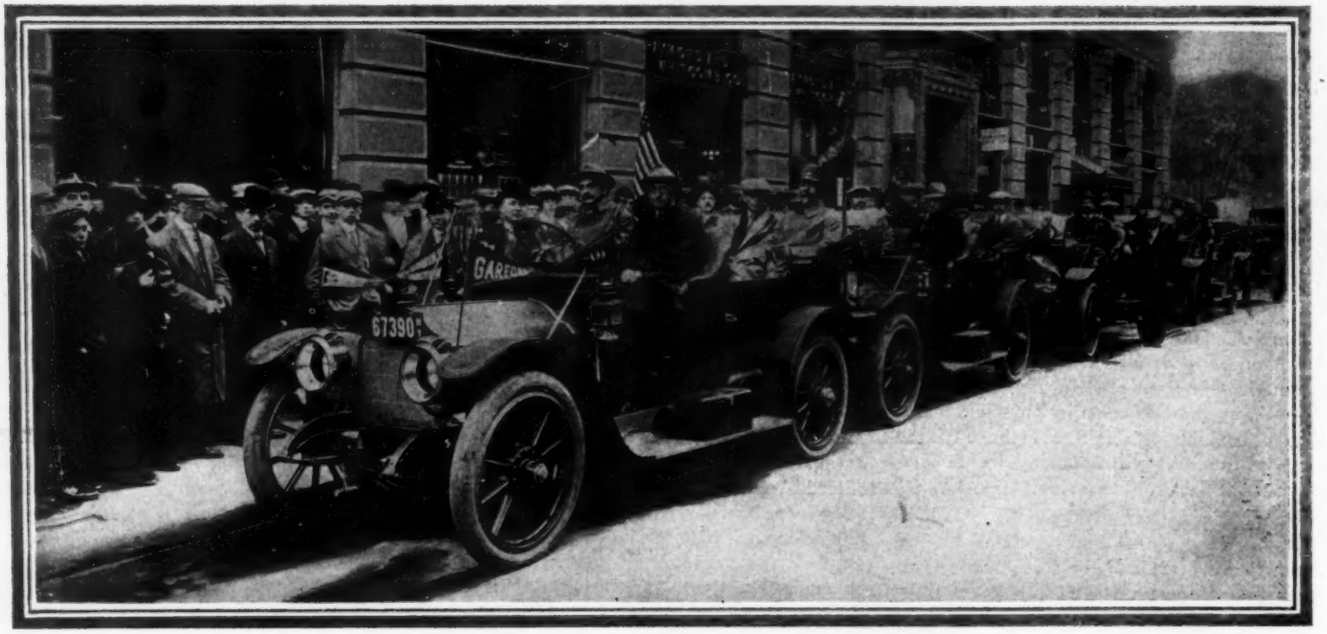
SIOUX CITY, IA.—A two-days' race meet will be held by the Sioux City Automobile Club October 20 and 21. Entries will close October 15. Each day there will be a 10-mile race for cars with a displacement of 161 to 230 inches, another for cars of 231 to 300 and a third for cars of 301 to 450. The first day there will be an Australian pursuit race and a 25-mile free-for-all. The second day there will be a 50-mile free-for-all. A total of $1,525 in prizes has been offered.

SYRACUSE, N. Y.—From data received by the Automobile Club of Syracuse the estimate of the number of automobiles under operation in this country is given at 500,000, representing an estimated outlay of $500,000,000. It is estimated that New York State has 50,000 machines. Pennsylvania is given second place, being accredited with from 40,000 to 50,000. Nevada and New Mexico are credited with the fewest number of automobiles, each having about 200 cars.

LANSING, MICH.—The Reo plant has resumed operations following the annual inventory. General Manager Richard H. Scott is authority for the statement that contracts with deposits have been closed for 10,243 cars to be delivered during the coming year, and he also states that the list of agencies has been increased 100 per cent. over that of last year. The report rendered at the annual stockholders' meeting of the company shows a surplus of $1,250,000, with $1,000,000 in cash on hand.

LANSING, MICH.—At the annual meeting of the board of directors of the Reo Motor Truck Company a 10 per cent. dividend was declared. During the past year certain parts of the truck have been manufactured

P. E. Sands and the Flanders "20," which won the "First to Hazelton" medal of the Pacific Highway Association, going 1,000 miles over a practically roadless country



Line-up of Garford cars at New York before they started on the trans-continental trip under the auspices of a well-known tourist agency

at the Reo factory, while other parts have been built at the plant on South Grand avenue formerly occupied by the Bement company. Hereafter the entire truck will be constructed and assembled at the Grand avenue factory, and it is estimated that about 500 men will be employed in this branch.

MINNEAPOLIS, MINN.—The Baker Electric is to be handled here by M. L. Hughes and A. H. C. Dalley in the twin cities and the Northwest.

KANSAS CITY, MO.—The A. J. Davies company, distributors for the Knox and Chadwick cars has taken the agency for the Bergdoll car.

PITTSBURGH, PA.—Director Howard B. Oursler, of the Department of Supplies, has bought three more auto propelled combination chemical and hose trucks to be delivered December 1st.

OKLAHOMA CITY, OKLA.—Makers and dealers having failed to support the proposed reliability run under the management of the Oklahoma State Automobile Association, it has been decided to call the event off.

MINNEAPOLIS, MINN.—The date for the hill climb to be held under the auspices of the Minneapolis Motor Club has been definitely fixed for October 21, weather permitting. It will take place on the Columbia Heights hill.

KANSAS CITY, MO.—C. E. Christian has taken charge of the Hupmobile branch and has removed to 3013 Main street. The Hupp-Yeats Electric branch has removed to the large and handsome quarters formerly occupied by the Detroit Electric branch at 3501 Main street. W. N. McWade, of Detroit, is the manager of the local branch of the Hupp-Yeats concern.

COLUMBUS, OHIO—Ohio and Indiana E. M. F. and Flanders automobile dealers to the number of 150 left recently via the T. & O. C. Railway on a special train consisting of nine Pullman cars for a two days' outing at Detroit as the guests of the Studebaker Automobile Company. The Twyman Motor Car Company, Columbus, representatives of the Studebaker Corporation, sent eighty of their dealers on the trip. The party will visit the ten Studebaker plants in Detroit and neighboring towns.

TOLEDO, OHIO—Automobiles will be pressed into service by the United States Government at Toledo for the purpose of conveying mail carriers in the business district to the starting point of their routes, thus saving all annoying delays which might otherwise result when the postal business is housed in its new post office some distance from the business section. The auto service will be inaugurated as soon as the main office is changed to the new building, which will be within the next few weeks.

INDIANAPOLIS, IND.—The Rajah Auto Supply Company recently brought suit in the Federal Court in Indianapolis against George F. Kreitlein, operating under the name of the Guarantee Tire & Rubber Company and the Dealers' Auto Supply Company, alleging Kreitlein was manufacturing and selling a spark plug infringing on patents covering the Rajah plug. Kreitlein has filed an answer, denying the allegation and stating that no less than eleven brands of spark plugs are on the market which are similar to the type manufactured by the Rajah company.

MILWAUKEE, WIS.—Albert Smith, 169 West Water street, representative of the Palmer-Singer in this territory, and for many years a well-known electrical man, died after a short illness, aged 48 years. Mr. Smith's death is attributed directly to a bantering wager with George Harvey, of Cleveland, Ohio, that he could drive from Milwaukee to Cleveland in two days' time without extra effort. With Mr. Harvey as a passenger, Mr. Smith easily won the wager in a two-passenger Palmer-Singer, but in doing so he contracted pneumonia, which resulted fatally within a week.

WILMINGTON, DEL.—A new law enacted by the General Assembly of Delaware this year for the protection of motor vehicles is to be given its first test at the November term of the court of General Sessions in and for New Castle county, in which Wilmington is located. This is a special law intended to put a stop to joy riding. For some time there had been a law on the statute books making it a punishable offense to drive off a horse without the consent of the owner, but automobilists had no such protection, but they have now and naturally there is some rejoicing. An arrest has recently been made and a test case will be tried.

INDIANAPOLIS, IND.—Judge Albert B. Anderson of the United States Circuit Court here has entered a decree enjoining Orion K. Stuart from obtaining empty Presto-O-Lite and Autogas tanks and refilling them for the purpose of putting them on the market. Judge Anderson has also referred the matter to Edward Daniels, master in chancery, who is to determine the amount of damages the Presto-O-Lite company has suffered by Stuart having filled such tanks. The decree also finds that the Autogas company has manufactured tanks infringing on the patents of the plaintiffs and that Stuart refilled tanks manufactured by the Autogas company.

NEW YORK CITY—A. R. Mosler & Co., are erecting a new factory at the corner of Wakefield and Webster avenues, Wakefield Park, New York City. The new building is constructed of brick and concrete, 100 x 150 feet and is two stories high. Two hundred and fifty people will be employed.

INDIANAPOLIS, IND.—Another three-story reinforced concrete building is being added to Auto Row, in North Capitol avenue, by the Globe Realty Company. It will cost $60,000 and will be completed February 1. The building will be occupied by the Henderson Motor Sales Company and the B. F. Goodrich Company's tire sales branch.

MINNEAPOLIS, MINN.—A show coliseum for Minneapolis, which is to be completed by next January in time for the automobile exhibition, was assured last Tuesday when the Board of Tax Levy appropriated $25,000 for an annex to the National Guard Armory in this city. When completed the entire building will hold more than 9,000 people, and will have a floor space of 72,000 square feet.

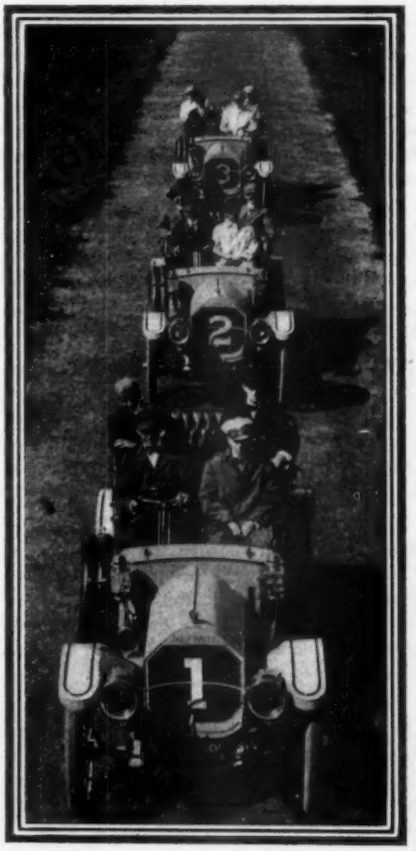
SOUTH BEND, IND.—One of the first steps taken by the city to install motor vehicles in all the fire stations during the next few years has been taken by the City Council appropriating $6,500 with which to purchase an automobile chemical engine. The Board of Safety has received specifications prepared by Fire Chief Wilfrid Grant, and will ask for a machine to conform to the plans of the chief.

MINNEAPOLIS, MINN.—On its return to the list of Minneapolis-sold cars the Marion makes its home with the new Marion Motor Car Company, 1027 Hennepin avenue. The company is officered by men old in the business. W. A. Crowe is president; W. A. Crowe, Jr., is vice-president; H. A. Crowe is secretary-treasurer. C. G. Wernicke, of Minneapolis, is sales manager.

BOSTON, MASS.—The Cork Insert Company announces that a reduction in the royalty charged for the right to use cork inserts in automobile clutches and brakes has been made. The royalty charged is now 90 cents on clutches transmitting less than 25 horsepower and $1.25 on clutches transmitting 25 horsepower or more, and 50 cents per vehicle for brakes.

CINCINNATI, O.—The announcement is made here that the Kruse Motor Car Company will hereafter control the complete line of Maxwell bodies and chassis, for this city, contracts to that effect having been concluded, and arrangements made, to become operative at once. The first specimens of the 1912 Maxwell, will soon be on exhibit at the Kruse Warerooms, on Seventh avenue.

NEW HAVEN, CONN.—The White Motors Company, which sells White cars and trucks in Connecticut, until recently located at 666 State street, has opened a handsome office and salesroom at 1094 Chapel street, where a complete line of the White Company's products will be carried. The officers are: P. R. Greist, president; H. M. Greist, treasurer, and W. A. Rutz, secretary and general manager.



Maxwell team which will represent Tarrytown, N. Y., in the Glidden tour—No. 1, Harry Walls; No. 2, E. G. Gager; No. 3, Thos. Costello

RACINE, WIS.—The motor car department of the J. I. Case Threshing Machine Company has started construction work on a new building to replace a large frame structure situated between Twenty-third and Twenty-fourth streets.

PITTSFIELD, MASS.—The Cortland Motor Wagon Company has moved its plant from Cortland, N. Y., to this city, in order to secure better shipping facilities. The new plant has a floor space of 50,000 square feet, and while the machinery has not yet been completely installed the management expect to have the manufacture of 1500-pound and one-ton trucks under way within a week.

BOSTON, MASS.—George W. Houk, manager of the New England branch of the Oldsmobile Company, with headquarters in Boston, has resigned and his successor is W. B. Fewell. Mr. Houk has not decided on his future plans, but he is considering an offer to go to London to manage a branch there. He spent several years in England previous to coming to Boston two years ago.

MILWAUKEE, WIS.—Manufacturers of motor vehicles are granted the lowest rates of all in the list arranged by the Employers' Mutual Liability Insurance Company of Wisconsin, organized to insure manufacturers against the hazards of the new workingmen's compensation or industrial insurance act passed by the Wisconsin Legislature and now in force. The rate per $100 of wages is fixed in a large number of cases and for motor manufacturers is 67 cents for Class A, 75 cents for Class B and 84 cents for Class C. The next lowest class pays 66 2-3 per cent. more.

Automobile Incorporations

AUTOMOBILES AND PARTS

ALEXANDRIA, VA.—B. F. Board Motor Truck Co.; capital, $25,000; to make freight automobiles. Incorporators: B. F. Board, Douglas Stuart, W. E. Bain, George S. Hinkins.

BROOKLYN, N. Y.—Osgood Motor Car Co.; capital, $10,000; to deal in automobiles. Incorporators: Samuel H. Misleind, Paul W. Smith, Irving J. Joseph.

BUFFALO, N. Y.—Baker Bros. Motor Co.; capital, $10,000; to deal in motor cars. Incorporators: Edward A. Green, Edward H. Baker, Clarence W. Baker.

MONTREAL, CAN.—Dunnings Limited; capital, $20,000; to deal in automobiles.

NOVATA, OKLA.—Nowata Motor Car Co.; capital, $2,500; to sell automobiles. Incorporators: Walter K. Campbell, George Gordon, Stanley J. Campbell.

OAKLAND, CAL.—S. & D. Motor Vehicle Co.; capital, $280,000; to deal in automobiles. Incorporators: B. E. Duckworth, A. A. Montague, Carlos Schmidt.

PEORIA, ILL.—Cadillac Automobile Co.; capital, $5,000; to sell automobiles. Incorporators: Rollin Travis, Henry Numann, H. H. Moody.

PROVIDENCE, R. I.—Providence Motor Car Co.; capital, $25,000; to deal in automobiles. Incorporators: John A. McDonald, Wm. H. McSoley, Alice Stanton.

RICHMOND, VA.—Grasberger Vehicle Co., Inc.; capital, $50,000; to deal in pleasure and freight automobiles. Incorporators: J. A. Grasberger, J. F. Sorg, Robert N. Wildbore.

RICHMOND, VA.—Motor Truck Co.; capital, $25,000; to sell freight automobiles. Incorporators: H. A. Gillis, Charles Laurens, T. M. Garrity, E. P. Cox.

AUTOMOBILE GARAGES, ACCESSORIES,

BUFFALO, N. Y.—Buffalo Reliable Garage; capital, $2,000; to conduct a general garage business. Incorporators: John J. Timmerman, Irving L. Carpenter, Charles H. Cutting.

BUFFALO, N. Y.—Kunz-Adams-McNamara Co.; capital, $10,000. Incorporators: H. M. Adams, William Kunz, O. B. McNamara.

CLEVELAND, OHIO.—Richardson-Neighbors Motor Co.; capital, $5,000; to sell accessories. Incorporators: F. E. Richardson, H. F. Neighbors; W. J. Dawley, Sidney Seidman, Stephen M. Young.

DAYTON, OHIO.—Acme Carbureter Co.; capital, $10,000; to manufacture carbureters and other accessories. Incorporators: Chas. S. Barkelew, E. Leiber McCallay, Chas. C. Margerum, W. H. Johnson, Lester Corson.

DAYTON, OHIO—Baker Taxicab Co.; capital, $10,000; to operate a garage and taxi business. Incorporators: George L. Baker, Frank R. Baker, Harry W. Baker, John N. Van Deman, Chas. D. Heald.

ELMIRA, N. Y.—Heater-Muffler Co.; capital, $50,000; to manufacture appliances for automobiles and engines. Incorporators: Wilber Kinzzie, Lanson D. Curran, Ansel G. Ingham.

INDIANAPOLIS, IND.—Merchants Auto Co.; capital, $50,000; to conduct a garage business. Incorporators: E. Darrow, Wm. E. Burk, Chas. S. Shotwell, H. H. Rice, C. L. Marshall, W. A. Atkins, Harvey B. Stout.

NEW YORK, N. Y.—Manhattan Top & Body Co.; capital, $50,000; to manufacture automobile equipments. Incorporators: Guy B. Kadford, Herman Schuler, Chas. D. Heintze.

UTICA, N. Y.—Divine Tire Demonstrating Co.; capital, $10,000. Incorporators: Bradford H. Divine, Edmund G. Munson, T. Harvey Ferris.

OF INTEREST to the INDUSTRY

KENOSHA, WIS.—There left the Rambler factory on Tuesday, October 3, the flagbearer of the Rambler line for 1912, which is to be relayed through the East by representatives of that company in the various cities on the route. The car was manned on the first lap by Walter R. Simkin, of Chicago, and Al Reeke, of Milwaukee, who drove it to Chicago, where Webb Jay took the wheel. In the illustration Charles T. Jeffery, president of the Thomas B. Jeffery Company, is seen bidding the first crew Godspeed.

BOSTON, MASS.—George L. Cooke has been appointed manager of the local agency for the Morse car.

BOSTON, MASS.—Lin McKie has been given charge of the Velie truck sales and maintenance in the Boston territory.

PHILADELPHIA—The local agency of the Krit car, the Kline-Krit Company, has been moved to Nos. 1405-1407 Race street.

BOSTON, MASS.—W. Mason Turner will represent the Amplex car here. He has secured quarters at 261 Dartmouth stret.

COLUMBUS, OHIO—F. E. Avery, 1199 Franklin avenue, has taken the central Ohio agency for the Packard and the Waverley Electric.

ATLANTA, GA.—The Velie Motor Company will soon open a branch in Atlanta. This company has secured a location at 447 Peachtree street.

MONTREAL, CANADA—The Motor Import of Canada, Ltd., have been appointed sales agents in the Province of Quebec for Pierce-Arrow motor cars.

ATLANTA, GA.—Hupp-Yeats Electrics and R. C. H. cars will soon be sold from their own branch in Atlanta, the new store at Peachtree and North avenue being now nearly completed.

INDIANAPOLIS, IND.—A factory sales branch of the Auburn Automobile Company was opened at 518 North Capitol avenue on October 2, with F. P. Bellinger in charge as manager.

BOSTON, MASS.—The Nance Six is a newcomer to Boston motor circles and salesrooms for it have been opened at 94 Massachusetts avenue. It is being handled by the Motor Car Company, recently organized.

MILWAUKEE, WIS.—The Lozier Motor Sales Company, 197-199 Ogden avenue, State distributor for the Lozier, has been appointed agent for the Marion, which heretofore has been represented by George W. Browne, 460 Milwaukee street.

BOSTON, MASS.—The Teel Manufacturing Company, of Medford, one of the suburbs of Boston, a concern that has been building wagons and automobile tops for years, has embarked in the commercial truck field and is now manufacturing a 5-ton vehicle.

KENOSHA, WIS.—Frederick Purdy, for many years a foreman in the shops of the Thomas B. Jeffery Company, has purchased the interest of the Kent Brothers in the Kent Motor Car Company and will henceforth conduct the garage on Church street.

GREEN BAY, WIS.—Lawrence Kittell and Charles W. Collier have formed a partnership under the style of Fox River Motor Car Company and will handle the Ford in this territory. A garage and salesrooms have been opened at 510-512 South Monroe street.

COLUMBUS, OHIO—The Board of Education has purchased a motor car for the use of Superintendent J. A. Shawan of the public schools. The car is to be at the disposal of the members of the Board of Education also when they are on official business.

MONTREAL, CANADA—The liquidators of the National Motor Car Company of Canada, Ltd., are calling for tenders for the sale of the business, which consists principally of stock in trade, furniture, fixtures, machinery and tools, the whole valued at $3,971.24.

MILWAUKEE, WIS.—The Wisconsin Auto Sales Company has been appointed Wisconsin distributor for the National, Cutting, Herreshoff and Westcott cars. The company has temporary headquarters at 114 Mason street in the Colby-Abbott building.

KANSAS CITY, MO.—W. S. Hathaway, general supervisor for the United States Motor Company has decided to retire from the automobile business. Mr. Hathaway represented the Buick company in this city for four years and the United States Motor Company the same length of time.

BOSTON, MASS.—C. F. Whitney, who handles the Alco in Boston and who had the Stoddard-Dayton until a week ago, has vacated the quarters on Commonwealth avenue and has moved downtown to Boylston street in Copley square. The Alco plans to establish its own branch in Boston.

PITTSBURGH, PA.—The Universal Motor Truck Company, of Warren, Ohio, which was formed in Denver a few years ago, is considering a change of location. Its officials have been considering Fairmont, W. Va., as a new home for the plant, which will employ 500 skilled workmen.

PITTSBURGH, PA.—The Penn Motor Car Company, which established a plant about a year ago in the East End and in which A. G. Breitwieser, a wholesale lumberman of this city, is largely interested, has finally decided to locate its immense plant at New Castle, Pa., 30 miles north of here. It has secured 9 acres of ground, 4 of which will be covered with buildings, it is announced. The initial investment for building and machinery will be about $350,000.

HAMILTON, ONTARIO — The Schacht Motor Company, of Cincinnati, Ohio, has purchased the plant of the Tilden-Jackson Typewriter Company, Hamilton, Ont., and has organized a Canadian company to manufacture commercial motor vehicles in Canada. The officers of the company are: President, Thomas P. Rolph, Toronto; vice-president, T. H. Schacht, Cincinnati; treasurer, Gerrard Muntz, Toronto; secretary and sales manager, J. S. Innes, Toronto.

PATENTS GONE TO ISSUE

CLUTCH MECHANISM—Motion is transmitted by means of a plurality of friction surfaces.

2. In the clutch shown in Fig. 1 a driving member is mounted on a shaft and having friction bearing surfaces thereon, while a driven member longitudinally slidable along the same shaft is provided and locked against rotation relatively thereto. A friction shoe is longitudinally movable along the shaft, another friction shoe radially, and independent yielding means are interposed between the driven member and the two friction shoes, so that, when the driven member is moved longitudinally and radially of the shaft, the shoes may be moved longitudinally and radially of the shaft respectively, and forced against the friction bearing surfaces on the driving member with a yielding pressure.

No. 1,004,940—To Frederick A. Thurston, assignor of forty-eight one-hundredths to Henry Mayberry Jones, both of Lynn, Mass. Granted October 3, 1911; filed July 19, 1910.

ACETYLENE GENERATOR—A plant for generating acetylene gas.

The invention which is protected by this patent consists in the combination of a carbide holder with, and mounted on top of, a generating tank; from this holder a pivoted feed-shoe is suspended which normally tends to assume a non-dumping position. A gasometer bell is provided, also an actuating shaft for the feed shoe, the shaft having a crank on which a pivoted lever is pivotally mounted, the crank engaging a counterweighted hook. Pivoted lever and gasometer bell communicate through actuating connections, and there is provided on the carbide holder an interference device which, when moved to a position permitting the opening of the carbide holder, engages the counterweighted hook.

No. 1,004,909—to Paul A. Rose, Chicago, Ill., assignor to Acetylene Apparatus Mfg. Co., Chicago, Ill. Granted October 3, 1911; filed March 9, 1910.

LIGHT PROJECTOR—Containing a reflector and a Fresnel type of lens.

3. The patent relates to the combination (Fig. 2) of a casing and lamp with a lens of the Fresnel type. The inner edge of an outwardly flaring and reflecting hood meets and surrounds the operative face of the lens, and a glass is provided at the outer edge of the hood. The angle of the reflecting surface of the hood is such that the lights rays projected through the miters of the lens and caused by them to be diverged away from the axis of the beam are caught and reflected by this surface and collected into an approximately parallel beam.

No. 1,004,628—To William Churchill, Corning, N. Y., assignor to Corning Glass Works, Corning, N. Y. Granted October 3, 1911; filed September 14, 1910.

PISTON RING—Consisting of a packing ring and supplementary member.

4. This patent refers to the combination of a piston head, a face plate secured thereto (Fig. 3), a split packing ring and a supplemental packing member, the ring and member being located between the piston head and face plate. Means are provided to normally hold the packing member toward the cylinder wall on the side where the split is located in the ring, and also means to secure all the members against rotation.

No. 1,004,631—To Thomas Davis, Pittsburgh, Pa. Granted October 3, 1911; filed January 13, 1911.

RUBBER TIRE—Containing a plurality of resilient sections and an externally mounted retaining ring.

A greater number of the sections than normally required form a continuous circle of the diameter of the retaining ring, which holds the sections in a compressed state.

No. 1,004,642—To George H. Gillette, New York Granted October 3, 1911; filed November 28, 1910.

ELECTRIC WELDING—Method of fixing a pin or rod to a plate.

The process consists in forming a countersink in the end of the pin or rod and one or more projections extending beyond the outer wall of the countersink and in uniting the pin or rod to the plate by an electric butt welding operation.

No. 1,004,795—To Laurence S. Lachman, New York, assignor to Universal Electric Welding Co., New York. Granted October 3, 1911; filed October 15, 1908.

STEERING MECHANISM LOCK—Toothed bars serve to hold steering knuckle in place.

In the device covered by this patent (Fig. 4) a toothed bar is fixed to the front axle of an automobile, and a movable toothed bar is connected to a steering knuckle. Means are provided to force the teeth of the two toothed bars into engagement, so that the movable bar is locked against movement under the influence of the steering knuckles to which it is connected.

No. 1,004,973—To George W. Benton, Finley, N. D. Granted October 3, 1911; filed January 26, 1911.

PNEUMATIC TIRE RIM—A rim having flanges overlapping and bolted to the felloe. The rim patented fits around a wheel felloe and has a portion of it beveled, the rim having a tire flange and another flange contacting with the felloe. A removable flanged ring fits the beveled portion of the rim and has a tire holding flange and a flange in contact with the felloe, bolts passing through the flanges contacting with the felloe and nuts being used to secure removable ring and beveled ring in place on the felloe. Lugs carried by the removable ring project over the flanged nuts.

No. 1,004,639—to Sylvester Cline Force, San Francisco, Cal. Granted October 3, 1911; filed January 6, 1910.

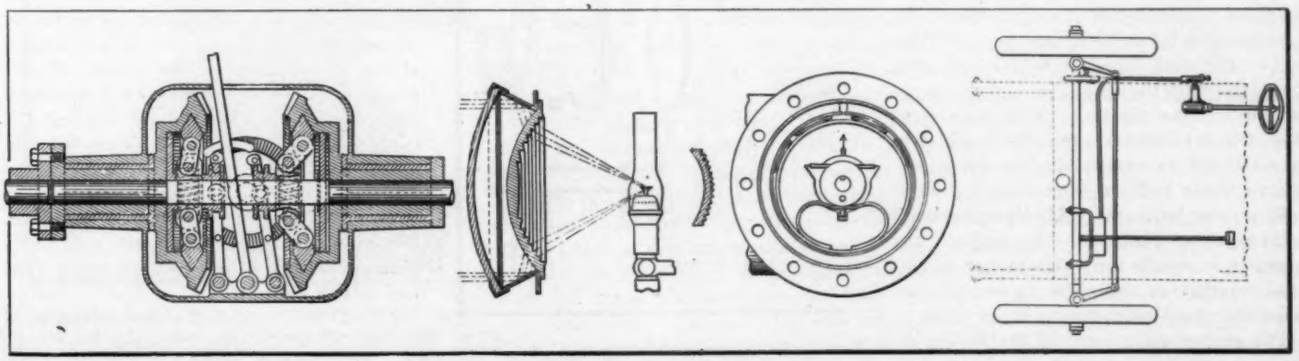


Fig. 1—Thurston clutch Fig. 2—Churchill projector Fig. 3—Davis piston ring Fig. 4—Benton steering gear

Newest Ideas Among the Accessories

Speedo Air Valve

SPEEDO, shown in Figs. 1 and 2 serves to regulate the air supplied to the engine at all speeds or to feed finely divided kerosene to the motor, when the latter needs decarbonizing. The exterior appearance of the device is shown in Fig. 1, illustrating the manner of attaching the Speedo to the intake manifold of the motor.

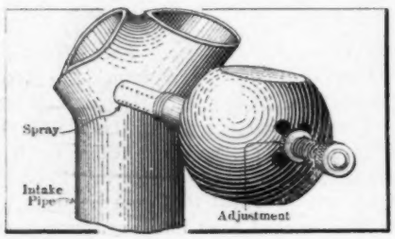


Fig. 1—Speedo auxiliary air supply on intake manifold

To install the Speedo it is necessary to drill a hole in the manifold at any suitable point above the carbureter and to tap it for 1-4-inch pipe thread.

After inserting the threaded stem of the Speedo in the opening made in the manifold, the nut marked for adjustment is loosened and the projecting stem of the device screwed inward as far as it may be advanced. It is necessary that in installing this accessory one flat side comes to the top position, so as to completely break up the gasoline molecules struck by the air entering the manifold from the Speedo.

The device having been installed, the engine is started and throttled down as low as possible; then the projecting stem is slowly screwed outward until the motor begins to pick up. At this point the retracting movement of the stem is stopped, the same is given a full turn in the inward direction and the adjustment nut locked tightly.

The Speedo now being ready for use, it will be well to examine Fig. 2 for an explanation of its operation. The casing is threaded at one end to fit into the manifold, twenty-eight holes being provided at that end of the stem, which is hollow and communicates with the inner space of the round portion of the Speedo. This portion is tapped to accommodate the projecting stem on which the air valve slides, the valve having an inner and an outer seating. If it falls on the latter, it covers up four holes serving as air intakes. The wall of the chamber in which the valve moves is tapered, so that as the valve is moved outward the space surrounding it increases.

The proper adjustment of the device insures a certain amount of spring tension, which tends to draw the valve away from its inner seat. When the motor is throttled down, the suction through the Speedo is naturally a comparatively great one, but it only tends to seat the valve more securely. If, however, the throttle opening is increased, the suction through the device decreases and is finally overcome by the spring tension, which then lifts the valve off its seat and permits air to pass through the Speedo into the manifold. The air leaving the outlet pipe crosswise in relation to the mixture traveling toward the motor strikes the gasoline molecules with a maximum of strength and breaks them up into finer parts. The effect of the Speedo and the air supplied by it to the motor increase with the engine speed.

If the Speedo is to be used for removing the carbon accumulated in the engine cylinders, kerosene is injected through it into the manifold. In this case a small rubber tube furnished with the Speedo and carrying at one end a brass connection is screwed onto the end of the projecting stem, after the cap shown in Fig. 2 has been removed for the purpose. The other end of the tube is made to hang down into a vessel containing one pint of kerosene, and if the motor is started, the oil is drawn into the hollow projecting stem, atomized through the nozzle formed by the inner end of this stem and mixed with the charge flowing from the carbureter to the motor. One pint of oil applied twice a month will remove the carbon settling in the cylinders during this time. This device is made by the International Accessories Corporation, of New York, Chicago and Los Angeles.

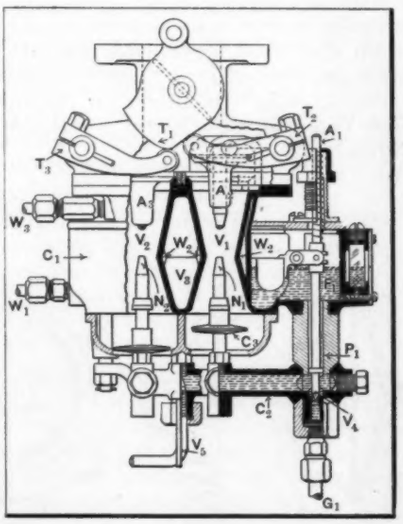


Fig. 2—Section showing details of C R G carbureter

C R G Carbureter

The special feature of the C R G carbureter shown in Fig. 3 is the fact that use is made in it of three Venturi tubes which are assembled in one casing C1 of the carbureter. These Venturi tubes V1, V2 and V3 have a gasoline nozzle concentrically located in each of them, as shown at N1 and N2, situated in V1 and

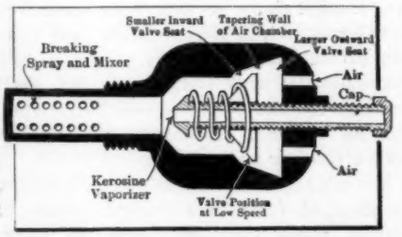


Fig. 2—Section showing principle of Speedo operation

V2 respectively. The nozzles are screwed into the gasoline connection C2. The gasoline enters at G1, fills the space of the connection C2 and then rises through pipe P1 to the float chamber F1 which surrounds the Venturi tubes on all sides. The gasoline flow is regulated by the needle valve V4, adjustable at A1, and after rising to a certain level in the float chamber the gasoline flows back into C2 to the nozzles, lifting the clappet valve C3 from its seating and permitting the fuel to flow into Venturi tube V1. The air is supplied through the seats of the clappet valves, when these are lifted through the suction of the motor.

In the operation of this carbureter, V1 is the Venturi tube which first comes into play. The throttle cam T1 operates the throttle lever T2, and opening the throttle position by the lever on the steering wheel moves the throttle cam in the direction indicated by the arrow, thus relieving the air valve A2 of the pressure holding it down and creating in the tube V1 a partial vacuum which lifts clappet valve C3 and permits gasoline and air to enter the Venturi tube. The needle valve V5 serves to adjust the flow of gasoline to a minimum at the slow speeds of the motor. If the position of the throttle cam T1 is advanced further, the second air valve A3 and the corresponding Venturi tube V2 are brought into action, giving the motor an additional supply of gasoline and air, the proportion of which, however, remains unaltered. Likewise, advancing the throttle cam to its ultimate position brings the high-speed Venturi tube V3 into play.

The C R G carbureter is manufactured by the C R G Manufacturing Co., Saugus, Mass.